



Maintenance and Service Guide

Compaq Armada 110 and Compaq Evo N110

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December 2001

This guide is a troubleshooting reference used for maintaining and servicing the notebook. It provides comprehensive information on identifying computer features, components, and spare parts, troubleshooting computer problems, and performing computer disassembly procedures.

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Maintenance and Service Guide

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Product Description

1.1 Models and Features

The Compaq Armada 110 and Evo N110 Series notebooks offer advanced modularity, Intel Pentium III or Intel Celeron processors with 64-bit architecture, industry-leading Accelerated Graphics Port (AGP) implementation, and extensive multimedia support.



Figure 1–1: Compaq Armada 110 and Evo N110

Models

Computer models are shown in Table 1-1.

Table 1-1
Compaq Armada 110 and Evo N110
Models and Model Naming Conventions

| Key | | | | | | | | | | | |
|-----|------------------------------|-----|----|--|---|---|-----|--|----|------------|--|
| N11 | P | 100 | 4X | 20 | V | C | 128 | 98 | 9L | XXXXXX-XXX | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Key | Description | | | Options | | | | | | | |
| 1 | Brand / Series designator | | | A=Armada N=Evo | | | | 11=110 | | | |
| 2 | Processor type | | | P=Intel Pentium III | | | | C=Intel Celeron | | | |
| 3 | Processor speed | | | 100=1.0 GHz 850=850 MHz | | | | 800=800 MHz 700=700 MHz | | | |
| 4 | Display type/size/resolution | | | 4=14.x" 2=12.x" | | | | X=XGA (1024 x 768) S=SVGA (800 x 600) | | | |
| 5 | Hard drive size | | | 20=20 GB 15=15 GB | | | | 10=10.0 GB | | | |
| 6 | Optical drive designator | | | V=8X Max DVD-ROM drive | | | | D=24X Max CD-ROM drive | | | |
| 7 | Integrated communication | | | M=modem 0=none | | | | C=modem/NIC combination card | | | |
| 8 | RAM | | | 64=64 MB | | | | 12=128 MB | | | |
| 9 | Operating system | | | 8=Windows 98 Me=Windows Millennium Edition (Me) | | | | 8M=Windows 98/ME dual install 2K=Windows 2000 | | | |
| 10 | Battery cells / type | | | L=9 cells, Lithium ion | | | | H=9 cells, Nickel Metal Hydride | | | |
| 11 | SKU# | | | | | | | | | | |

Table 1-1
Compaq Armada 110 and Evo N110
Models and Model Naming Conventions (Continued)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|----------------------------|------------|-----|----|----|---|---------------------|----|----|----|--------------|
| N11 | P | 100 | 4X | 20 | V | C | 25 | 2K | L | |
| Danish | 470028-444 | | | | | Italian | | | | 470028-462 |
| Dutch | 470028-464 | | | | | Spanish | | | | 470028-468 |
| European | 470028-442 | | | | | Swedish/Finnish | | | | 470028-473 |
| French | 470028-449 | | | | | Swiss | | | | 470028-478 & |
| French | 470028-417 | | | | | U.K. English | | | | 470028-483 |
| Canadian | | | | | | U.S. English | | | | 470028-485 |
| German | 470028-454 | | | | | | | | | 470028-435 |
| Greek/Polish | 470028-459 | | | | | | | | | |
| N11 | P | 100 | 4X | 20 | V | C | 12 | 2K | L | |
| Asia/Pacific | 470028-515 | | | | | Japanese | | | | 470028-409 |
| Australian | 470028-489 | | | | | | | | | |
| N11 | P | 100 | 4X | 20 | V | C | 12 | 8 | L | |
| People's Republic of China | | | | | | | | | | 470028-503 |
| N11 | P | 100 | 4X | 20 | V | C | 12 | M | L | |
| Arabic | 470028-402 | | | | | Korean | | | | 470028-420 |
| Czech | 470028-404 | | | | | Norwegian | | | | 470028-411 |
| Dutch | 470028-409 | | | | | Portuguese | | | | 470028-412 |
| European | 470028-403 | | | | | Russian | | | | 470028-414 |
| Greek/Polish | 470028-405 | | | | | Slovakian/Slovenian | | | | 470028-416 |
| Hebrew | 470028-407 | | | | | Swedish/Finnish | | | | 470028-418 |
| Hong Kong | 470028-423 | | | | | Taiwanese | | | | 470028-421 |
| Hungarian | 470028-406 | | | | | Turkish | | | | 470028-420 |

All Compaq Evo N110 computer models use configuration code **KFKZ**.

Table 1-1
Compaq Armada 110 and Evo N110
Models and Model Naming Conventions (Continued)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--|---|-----|------------|----|---|-----------------------------------|----|----|--------------|----|
| N11 | C | 100 | 4X | 20 | D | C | 12 | 8M | L | |
| Asia Pacific/Thai | | | 470028-598 | | | Latin American Spanish | | | 470028-441 | |
| Australian | | | 470028-443 | | | | | | | |
| Danish | | | 470028-428 | | | Latin American Spanish (NAFTA) | | | 470028-497 | |
| French | | | 470028-429 | | | Spanish | | | 470028-436 | |
| French Canadian | | | 470028-426 | | | Swiss | | | 470028-438 | |
| German | | | 470028-431 | | | | | | & 470028-439 | |
| Italian | | | 470028-433 | | | U.K. English | | | 470028-440 | |
| Japanese | | | 470028-445 | | | U.S. English | | | 470028-424 | |
| | | | | | | U.S. English (NAFTA) | | | 470028-496 | |
| N11 | C | 100 | 4X | 20 | D | C | 12 | 2K | L | |
| Asia Pacific | | | 470028-479 | | | Greek/Polish | | | 470028-460 | |
| Australian | | | 470028-480 | | | Italian | | | 470028-461 | |
| Danish | | | 472028-452 | | | Japanese | | | 470028-482 | |
| Dutch | | | 470028-510 | | | Spanish | | | 470028-466 | |
| European | | | 470028-451 | | | Swedish/Finnish | | | 470028-467 | |
| French | | | 470028-455 | | | Swiss | | | 470028-470 & | |
| French Canadian | | | 470028-448 | | | | | | 470028-471 | |
| German | | | 470028-457 | | | U.K. English | | | 470028-474 | |
| All Compaq Evo N110 computer models use configuration code KFKZ . | | | | | | | | | | |

Table 1-1
Compaq Armada 110 and Evo N110
Models and Model Naming Conventions (Continued)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--|---|-----|----|----|---|---|----|---|----|------------------------|
| The following Compaq Armada 110 computer models use configuration code KFKZ . | | | | | | | | | | |
| A11 | P | 850 | 4X | 20 | D | C | 64 | M | L | 243859-B21 |
| A11 | P | 850 | 4X | 20 | D | C | 64 | M | L | 243860-B21 (NAFTA) |
| A11 | C | 850 | 4X | 20 | D | C | 64 | M | H | 258292-B21 |
| A11 | C | 850 | 4X | 15 | D | C | 64 | M | H | 243857-B21 |
| A11 | C | 850 | 4X | 15 | D | C | 64 | M | H | 243858-B21 (Europe) |
| A11 | C | 850 | 2S | 15 | D | C | 64 | M | H | 243854-B21 |
| A11 | C | 850 | 2S | 15 | D | C | 64 | M | H | 243855-B21 (NAFTA) |
| A11 | C | 850 | 2S | 15 | D | C | 12 | M | H | 243856-B21 |

Table 1-1
Compaq Armada 110 and Evo N110
Models and Model Naming Conventions (Continued)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--|---|-----|----|----|---|---|----|----|----|-----------------------|
| The following Compaq Armada 110 computer models use configuration code JMVZ . | | | | | | | | | | |
| A11 | P | 800 | 4X | 10 | V | C | 64 | M | L | 226917-B21 |
| A11 | P | 800 | 4X | 10 | D | C | 64 | M | L | 226915-B21 |
| A11 | P | 800 | 4X | 10 | D | C | 64 | M | L | 231665-B21 (NAFTA) |
| A11 | P | 800 | 2S | 10 | D | C | 64 | M | L | 226918-B21 |
| A11 | C | 700 | 4X | 10 | D | C | 64 | M | L | 231664-B21 |
| A11 | C | 700 | 4X | 10 | D | C | 64 | M | H | 226919-B21 |
| A11 | C | 700 | 2S | 10 | D | M | 64 | 8M | H | 226921-B21 |
| A11 | C | 700 | 2S | 10 | D | M | 64 | 8M | H | 231663-B21 (NAFTA) |

Features

- Processors, varying by computer model:
 - 1.0-GHz or 850- or 800-MHz Intel Pentium III processors, with 256-KB integrated cache, varying by computer model
 - 1.0-GHz or 850- or 700-MHz Intel Celeron processors, with 128-KB integrated cache, varying by computer model
- ATI RAGE LT Pro, 4-MB SGRAM (synchronous graphics)
- 64-MB high-performance Synchronous DRAM (SDRAM), expandable to 320 MB
- Microsoft Windows 98 or Windows Me preinstalled

- Displays, varying by computer model:
 - 14.1-inch, SXGA, TFT (1024 × 768) display, with over 16.8 million colors
 - 12.1-inch, SVGA, TFT (800 × 600) display, with over 16.8 million colors
- Full-size TouchPad keyboard
- Mini PCI 56K V.90 modem or mini PCI V.90 modem plus 10/100 NIC combination card, varying by computer model
- One Type II PC Card slot with support for both 32-bit CardBus and 16-bit PC Cards
- External AC adapter with power cord
- 9-cell Lithium ion (Li ion) or Nickel Metal Hydride (NiMH) battery pack
- 20- or 10-GB high-capacity hard drive, varying by computer model
- Connectors for:
 - stereo speaker/headphone
 - microphone
 - universal serial bus
 - RJ-45 network (internal network models only)
 - RJ-11 modem
 - keyboard/mouse
 - AC power
 - infrared port
- Stereo speakers

1.2 Security

If the notebook you are servicing has a password and you know the password, follow these steps to disable or clear the password:

1. Access PhoenixBIOS Setup Utility (PSU) by turning on the computer and pressing **F10** when the Compaq logo displays on the screen.
2. Enter the current password and press **enter**.
3. Move to **Password On Boot**. Use the + or - key to select **disable** and press **enter**.
4. Move to **Set Supervisor Password**. In the upper space, enter the current password and press **enter**. In the spaces to enter the new password and confirm new password, press **enter**. Press **enter** again to exit the screen.
5. Use the arrow keys to select **Exit** from the menu bar.
6. Make sure **Exit Saving Changes** is selected. Press **enter**, then select **Yes** to save the changes and exit.

If the notebook you are servicing has an unknown password, follow these steps to clear the password. These steps also clear CMOS.

1. Prepare the computer for disassembly. Refer to Section 5.3, “Preparing the Computer for Disassembly,” for more information.
2. Remove the disk cell RTC battery (refer to Section 5.15, “Disk Cell Real Time Clock (RTC) Battery”).
3. Wait approximately five minutes.

4. Reassemble the computer.
5. Connect AC power to the computer. Do **NOT** reinsert the battery pack at this time.
6. Turn on the computer.
7. All passwords and all CMOS settings are clear.

1.3 Power Management

The computer operating system provides power management utilities that help maintain and conserve power when the computer is running on battery power.

To access power management options, select the power application icon in the operating system's Control Panel.

Enabling Power Savings

The Enable Power Savings feature in Power Management controls all power management features. When set to disabled, the power menu is automatically disabled. The default setting is enabled.

Timeout Settings

Timeout functions can be set up to power down computer components by selecting the Power Schemes tab from the power application in the operating system's Control Panel. When a component such as the monitor, hard drive, system, or video is not in use, the component powers down to conserve power. The time out interval can be set from one minute up to several hours. The component will power up again when you access it or press any key.

Setting Standby

Standby is initiated by pressing the **Fn+F4** hotkeys or automatically by the computer if it reaches the defined percentage of battery pack power remaining. When Standby is initiated, several subsystems will power off to conserve energy. The system will wake up from Standby when a key is pressed. Although the Standby mode maintains the information and opens the file upon wake-up, any unsaved information is lost if the computer is turned off before ending Standby.

Hibernation

Hibernation is an energy-saving feature and safeguard that saves information in RAM to a hibernation file on the hard drive, then shuts down the computer. Hibernation is initiated by the computer when the computer reaches the defined percentage of battery pack power remaining. To wake the computer from Hibernation, press the power button. When you resume work, the information returns to the screen where you left off.

The computer uses the operating system with a power management utility that helps you maintain and conserve power when the computer is running on battery power.

Standby

Standby is an energy-saving feature that conserves power and reduces startup time.

Standby reduces power to system components that are not being used. Standby can be initiated by you or by the system. When Standby is initiated, all work is saved in random access memory (RAM) and the screen is cleared. When work is resumed, the information returns to the screen.

Refer to Section 1.4 in this chapter to identify the Power, Standby, and Hibernation controls.

1.4 Computer External Components

The external components on the display and left side of the computer are shown in Figure 1-2 and described in Table 1-2.



Figure 1–2: Display and Left Side Components

Table 1-2
Display and Left Side Components

| Item | Component | Function |
|------|-----------------------|---|
| 1 | Display release latch | Releases the display to open the computer. |
| 2 | Infrared port | Links another IrDA-compliant device for wireless communication. |
| 3 | Vent | Allows airflow to cool internal components. |
| 4 | PC Card slot | Supports 32-bit (CardBus) and 16-bit PC Cards. |
| 5 | PC Card eject button | Ejects a PC Card from the PC Card slot. |
| 6 | Diskette drive | Accepts 3.5-inch diskettes. |

The computer right side and rear panel components are shown in Figure 1-3 and described in Table 1-3.

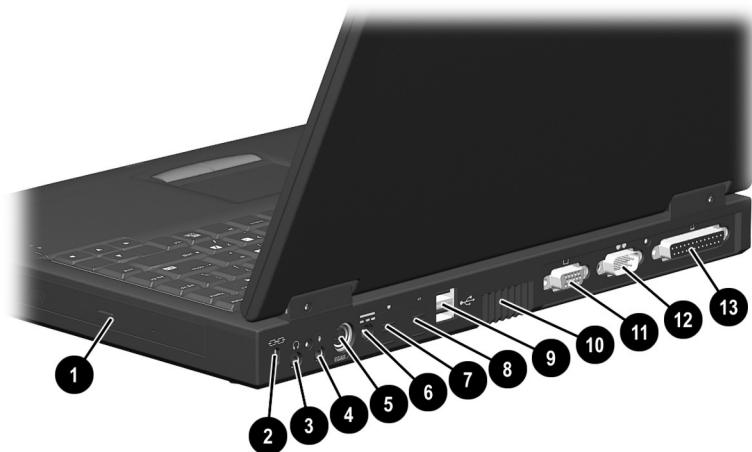


Figure 1–3: Right Side and Rear Panel Components

Table 1-3
Right Side and Rear Panel Components

| Item | Component | Function |
|------|--------------------------------|---|
| 1 | Optical drive | Accepts CD- or DVD-ROM disks, depending on the computer model. |
| 2 | Security cable slot | Attaches an optional security cable to the computer. |
| 3 | Stereo speaker/ headphone jack | Connects stereo speakers, headphones, headset, or television audio. |
| 4 | Microphone jack | Connects a single sound channel microphone. |

Table 1-3
Right Side and Rear Panel Components (*Continued*)

| Item | Component | Function |
|------|---|--|
| 5 | Keyboard/mouse connector | Connects an optional full-sized keyboard or a mouse. When this connector is used, both the external and computer keyboard and pointing device are active. An optional splitter/adapter allows both an external keyboard and mouse to be used at the same time. |
| 6 | Power jack | Connects any one of the following: <ul style="list-style-type: none"> ■ AC Adapter ■ Optional Automobile Power Adapter/Charger ■ Optional Aircraft Power Adapter |
| 7 | RJ-11 jack (internal modem models only) | Connects the modem cable to an internal modem.  A modem cable is included with internal modem models. |
| 8 | RJ-45 jack (network models only) | Connects the network cable.  A network cable is included with network models. |
| 9 | Universal Serial Bus (USB) connector | Connects USB devices. |
| 10 | Vent | Allows airflow to cool internal components. |
| 11 | Serial connector | Connects a serial device. |
| 12 | External monitor connector | Connects an external monitor or overhead projector. |
| 13 | Parallel connector | Connects a parallel device. |

The computer keyboard components are shown in Figure 1-4 and described in Table 1-4.



Figure 1–4: Keyboard Components

Table 1-4
Keyboard Components

| Item | Component | Function |
|-------------|--|--|
| 1 | Fn key | Used with hotkeys to perform preset hotkey functions. |
| 2 | Caps lock key | Turns on the caps lock function. |
| 3 | F1 through F12 function keys | Perform preset functions. |
| 4 | Display switch | Turns off the computer display if the computer is closed while on. |
| 5 | Embedded numeric keypad | Converts keys to numeric keypad. |
| 6 | Cursor control keys | Move the cursor around the screen. |
| 7 | Windows application keys | Displays a menu when using a Microsoft application. The menu is the same that is displayed by pressing the right mouse button. |
| 8 | Microsoft logo key | Displays Windows Start menu. |

The components on the top of the computer are shown in Figure 1-5 and described in Table 1-5.

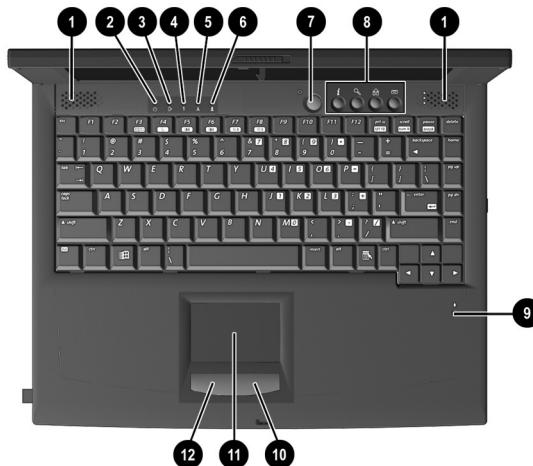


Figure 1-5: Top Components

**Table 1-5
Top Components**

| Item | Component | Function |
|-------------|------------------|---|
| 1 | Speakers (2) | Produce stereo sound. |
| 2 | Hard drive light | On: The primary hard drive is being accessed. |

Table 1-5
Top Components (Continued)

| Item | Component | Function |
|------|-------------------------|---|
| 3 | Battery light | Green steady: Battery charging is complete. Red steady: Battery pack is charging. Red blinking: Battery pack is being queried, computer cannot communicate with battery pack, or battery pack is bad. |
| 4 | Num lock light | On: Num lock is on and the embedded numeric keypad is enabled. |
| 5 | Caps lock light | On: Caps lock is on. |
| 6 | Scroll lock light | On: Scroll lock is on. |
| 7 | Power button | Turns the computer on or off or exits Standby. |
| 8 | Easy Access buttons (4) | Four buttons that provide quick access to the Internet. |
| 9 | Microphone | Inputs single-channel sound to the computer; can be used whether the computer is open or closed. |
| 10 | Right TouchPad button | Functions like the right mouse button on an external mouse. |
| 11 | TouchPad | Moves the mouse cursor, selects, and activates. |
| 12 | Left TouchPad button | Functions like the left mouse button on an external mouse. |

The external components on the bottom of the computer are shown in Figure 1-6 and described in Table 1-6.

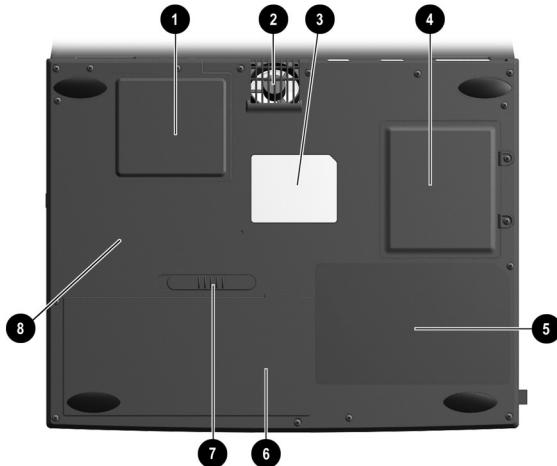


Figure 1–6: Bottom Components

Table 1-6
Bottom Components

| Item | Component | Function |
|-------------|-----------------------------------|---|
| 1 | Mini PCI slot cover | Contains the mini PCI modem or network interface card. |
| 2 | Fan vent | Provides airflow to cool internal components. |
| 3 | Certificate of Authenticity label | Contains the Product Key, which may need to be entered before using some Windows operating systems. |
| 4 | Memory expansion compartment | Covers the memory expansion compartment. |
| 5 | Front label area | Contains agency information. |
| 6 | Battery compartment | Accepts a 9-cell Lithium ion (Li ion) or Nickel Metal Hydride (Ni MH) battery pack. |
| 7 | Battery release latch | Releases the battery pack from the battery bay. |
| 8 | Serial number | Identifies the computer. |

1.4 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to Chapter 3, “Illustrated Parts Catalog” and Chapter 5, “Removal and Replacement Procedures.”

The system board provides the following device connections:

- Memory expansion board
- Hard drive
- Display
- Keyboard/TouchPad
- Audio
- Intel Pentium III or Intel Celeron Processors
- Fan
- PC Card
- Modem or modem/NIC
- Microphone

The computer uses an electrical fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the right side of the computer.



CAUTION: To properly ventilate the computer, allow at least a 3-inch (7.6 cm) clearance on the left and right sides of the computer.

Troubleshooting



WARNING: Only authorized technicians trained by Compaq should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

Utilities that are preinstalled on the computer include:

- **PhoenixBIOS Setup Utility**—Allows you to modify or restore factory default settings and configure the system BIOS to diagnose and solve minor problems.
- **Power Management**—Allows you to reduce your computer power consumption. Power Management information is contained in Chapter 1.
- **Security**—Allows you to set or remove your power-on password. Security information is contained in Chapter 1.

Using the PhoenixBIOS Setup Utility

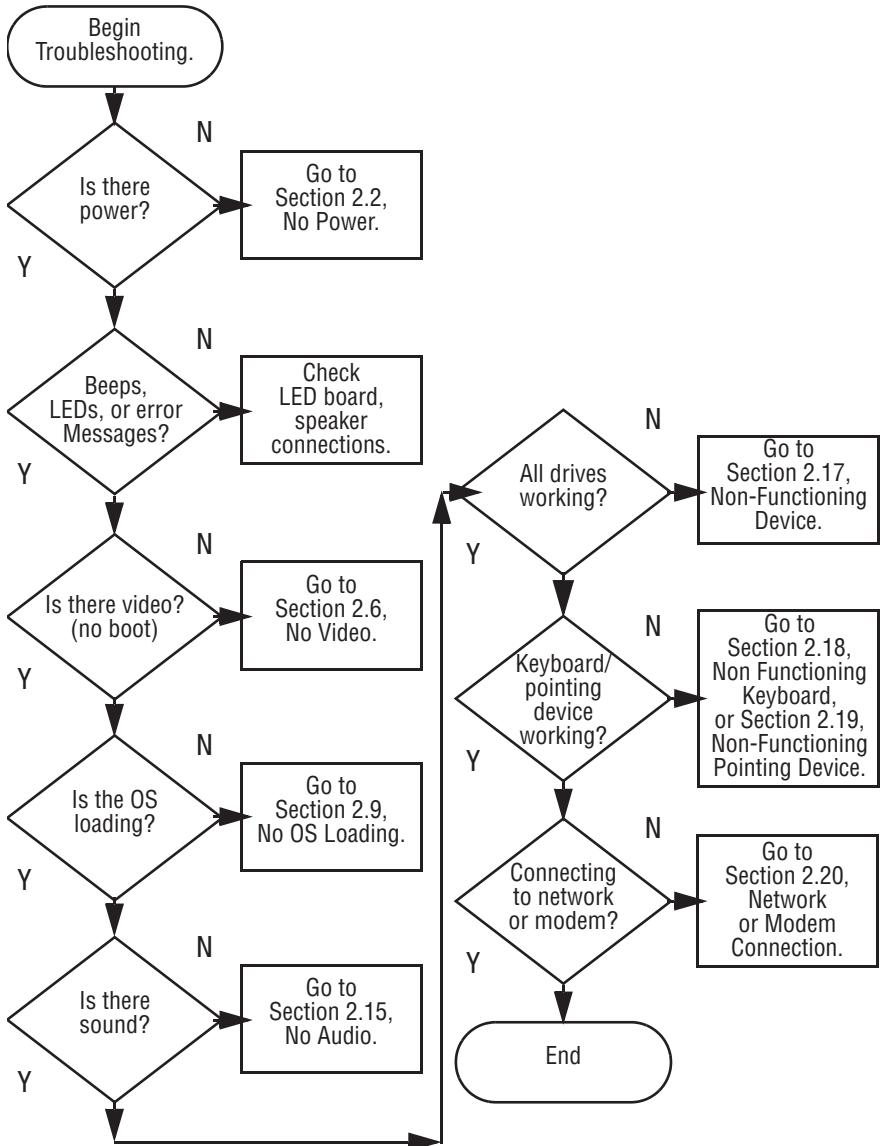
The PhoenixBIOS Setup Utility (PSU) is built into the system. You can configure the system BIOS and modify or restore factory default settings, such as date and time, types of disk drives, power management, and password settings. To run PSU, press **F10** during system startup. When the main screen displays, use the keyboard and arrow keys to move around the menus and make selections.

Troubleshooting Flowcharts for Portable Computers

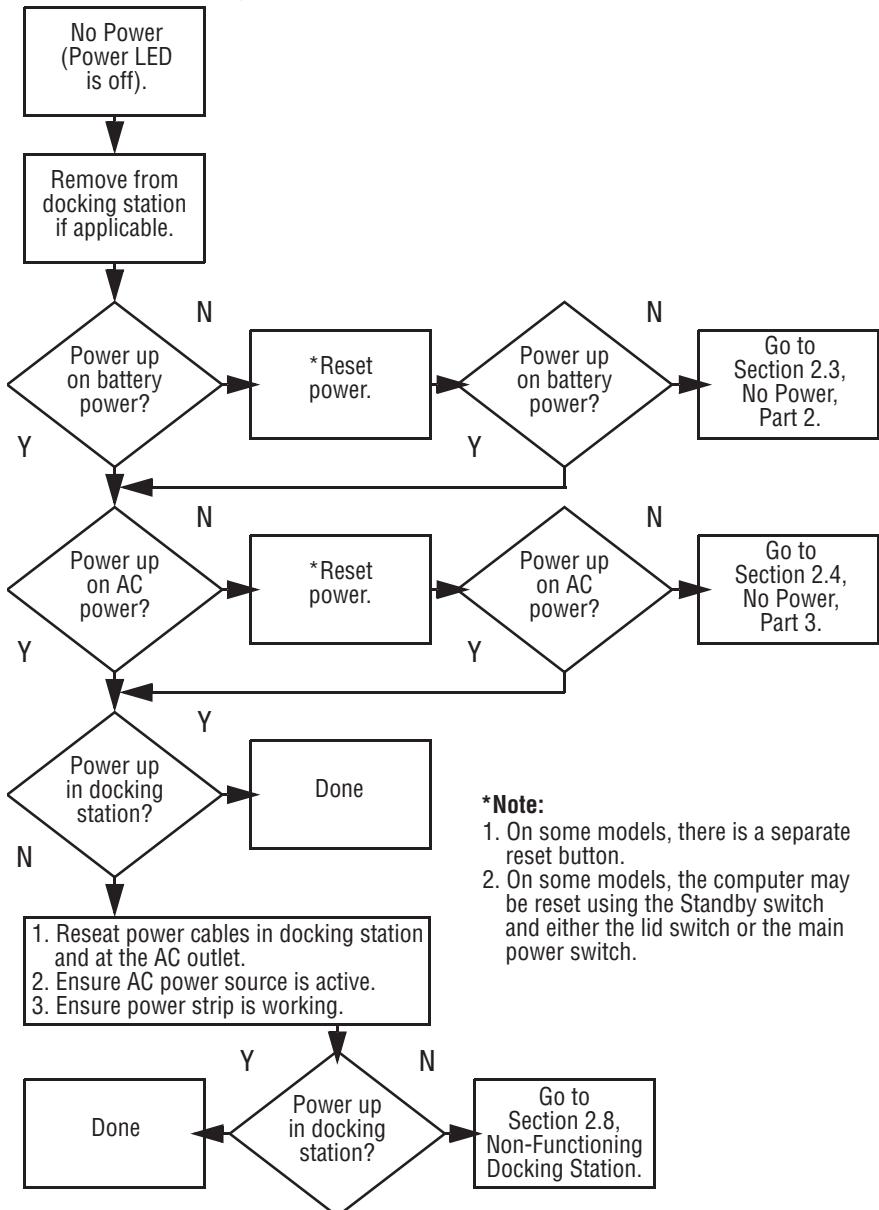
Table 2-1
Troubleshooting Flowcharts Overview

| Section | Description |
|----------------|---------------------------------------|
| 2.1 | Initial troubleshooting |
| 2.2 | No power, part 1 |
| 2.3 | No power, part 2 |
| 2.4 | No power, part 3 |
| 2.5 | No power, part 4 |
| 2.6 | No video, part 1 |
| 2.7 | No video, part 2 |
| 2.8 | Non-functioning docking station |
| 2.9 | No operating system (OS) loading |
| 2.10 | No OS loading from hard drive, part 1 |
| 2.11 | No OS loading from hard drive, part 2 |
| 2.12 | No OS loading from hard drive, part 3 |
| 2.13 | No OS loading from diskette drive |
| 2.14 | No OS loading from CD-/DVD-ROM drive |
| 2.15 | No audio, part 1 |
| 2.16 | No audio, part 2 |
| 2.17 | Non-functioning device |
| 2.18 | Non-functioning keyboard |
| 2.19 | Non-functioning pointing device |
| 2.20 | No network or modem connection |

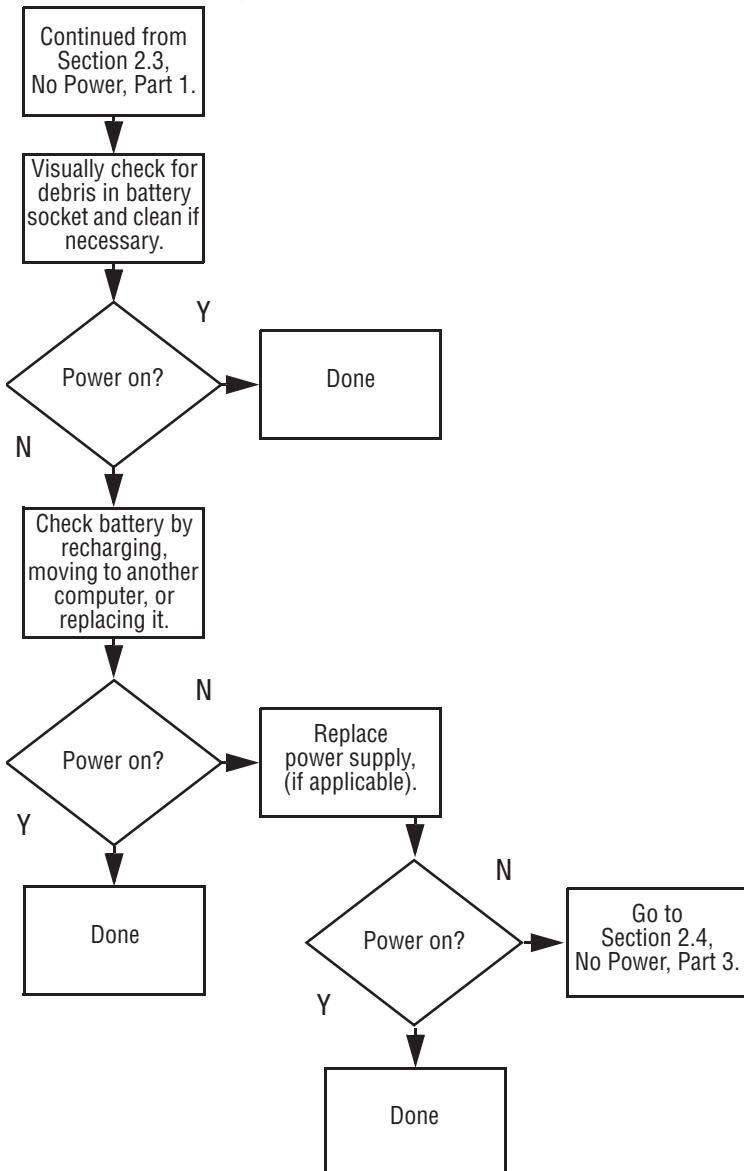
2.1 Initial Troubleshooting



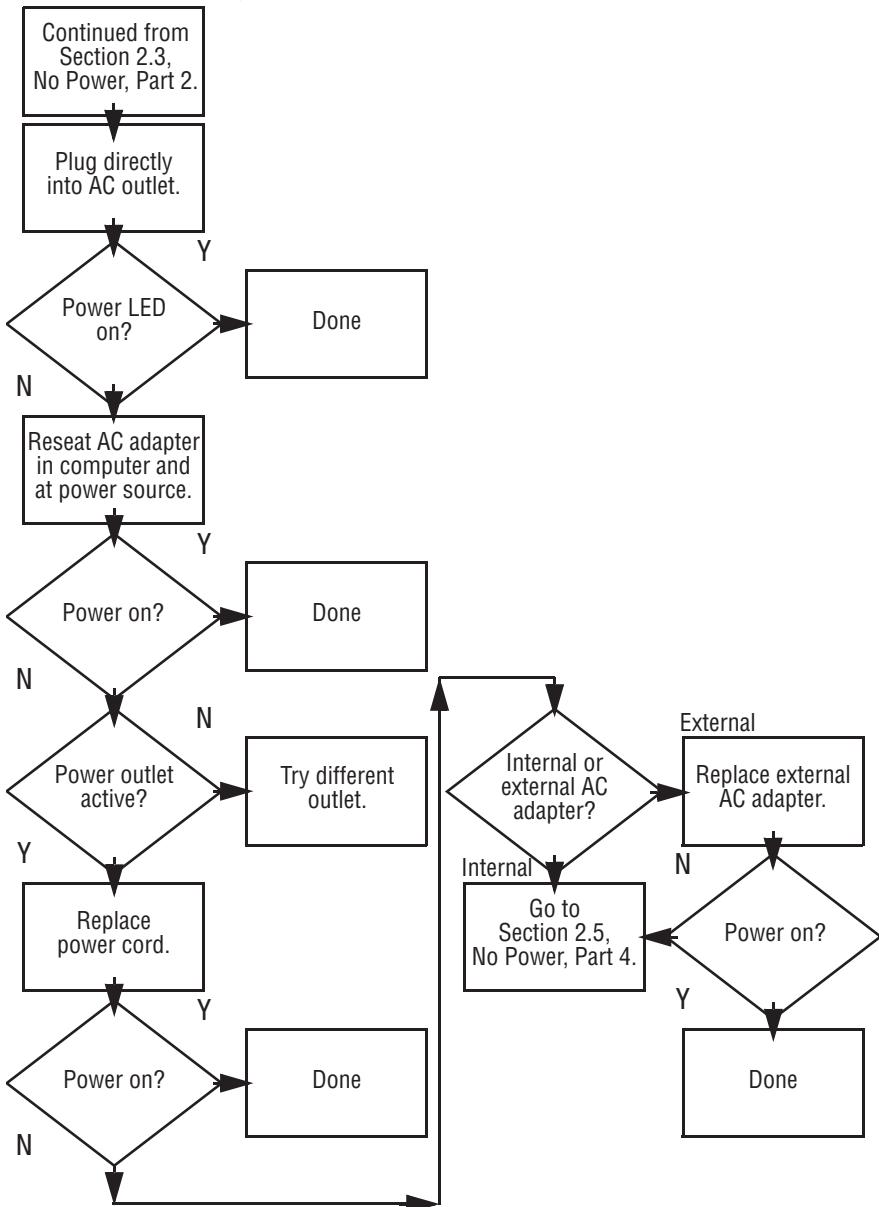
2.2 No Power, Part 1



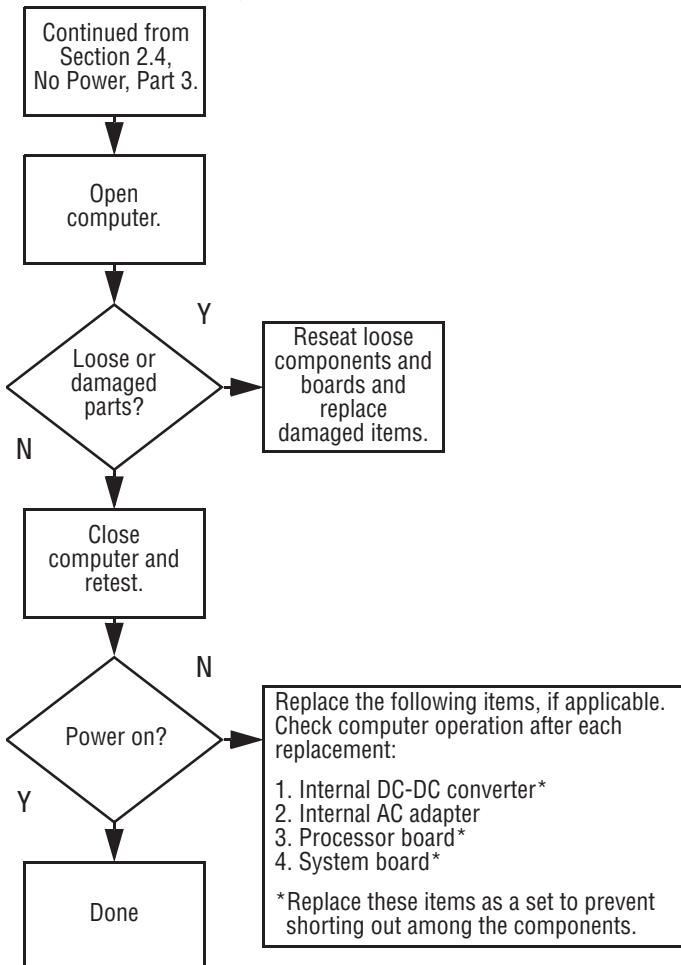
2.3 No Power, Part 2



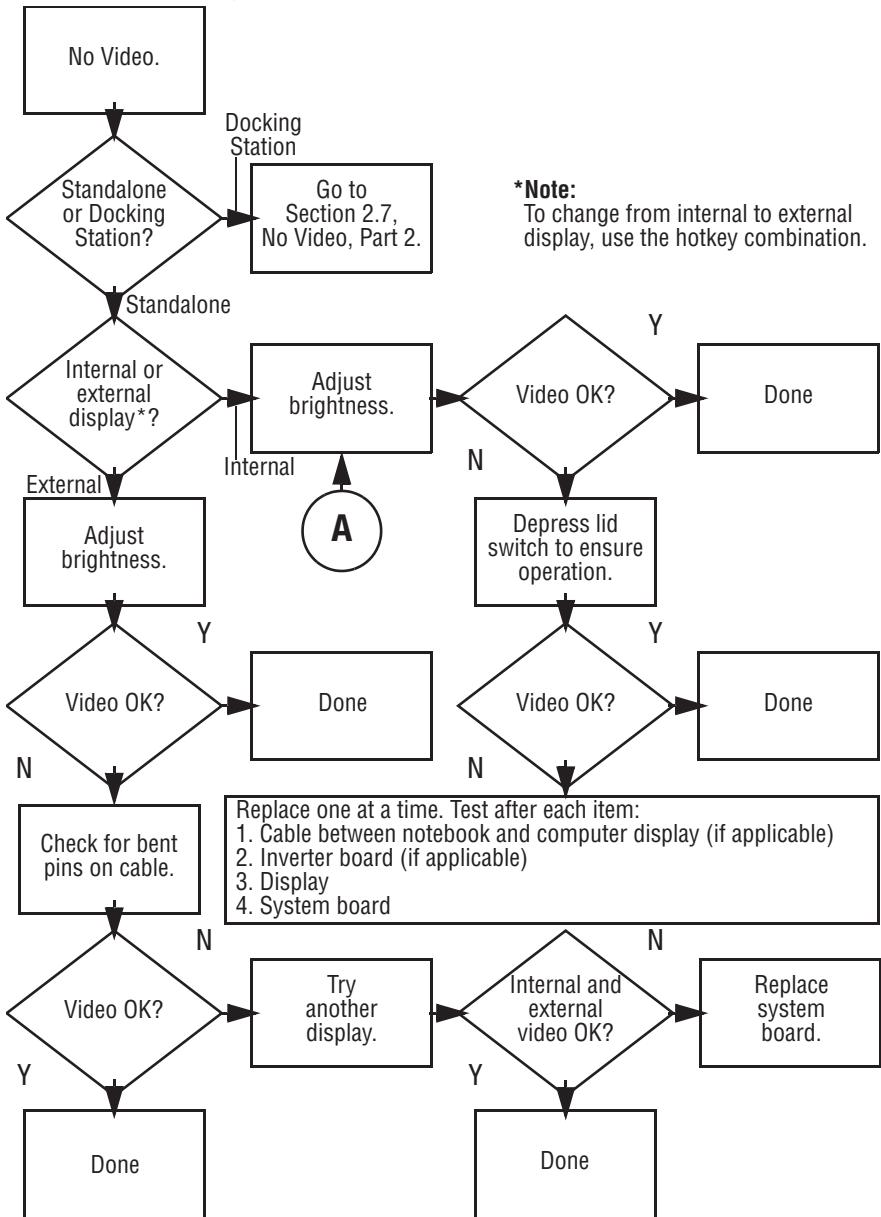
2.4 No Power, Part 3



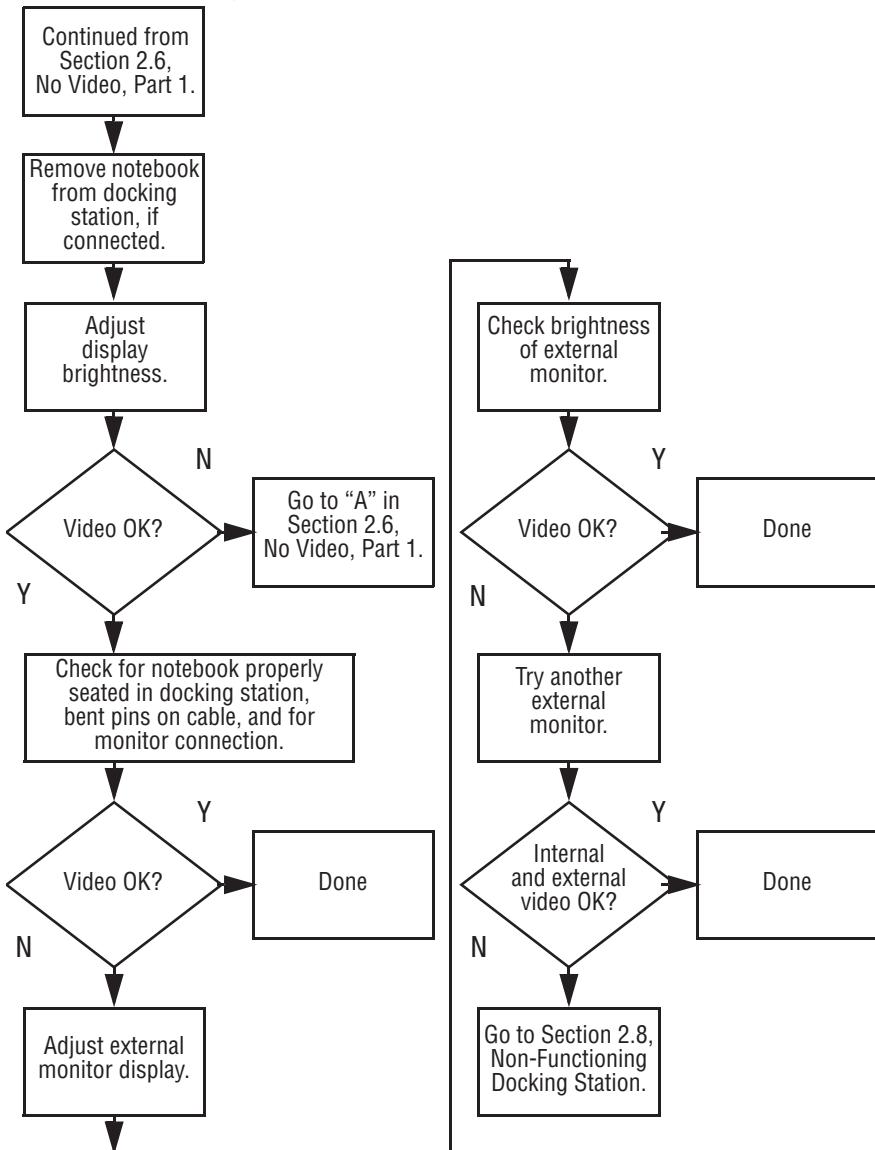
2.5 No Power, Part 4



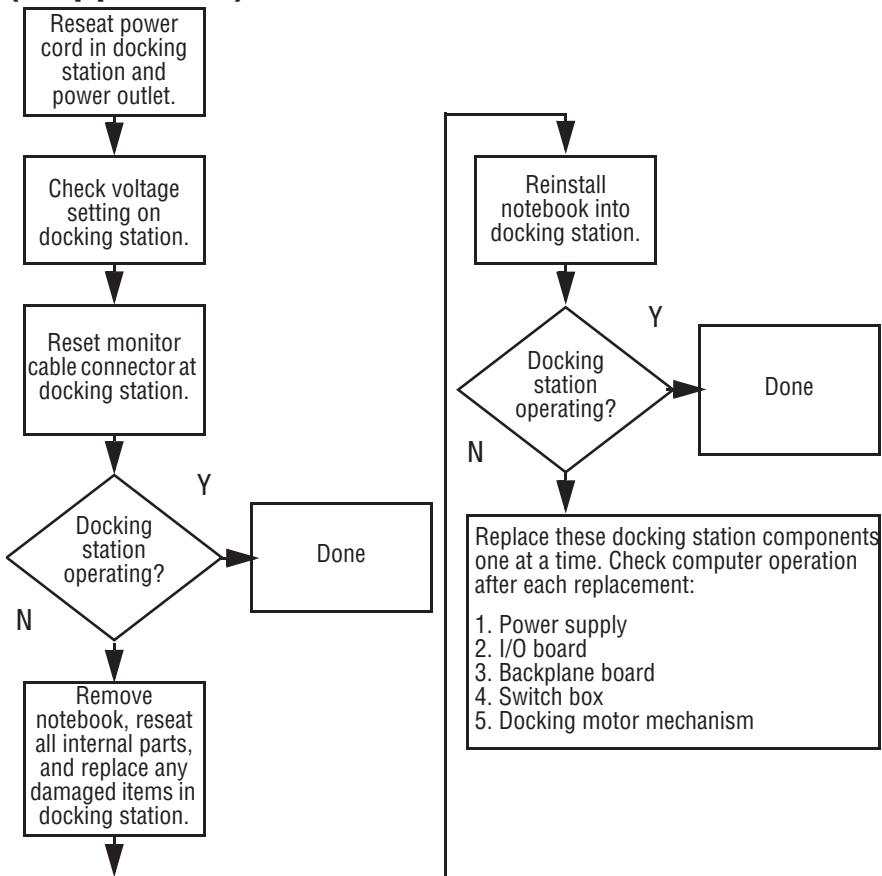
2.6 No Video, Part 1



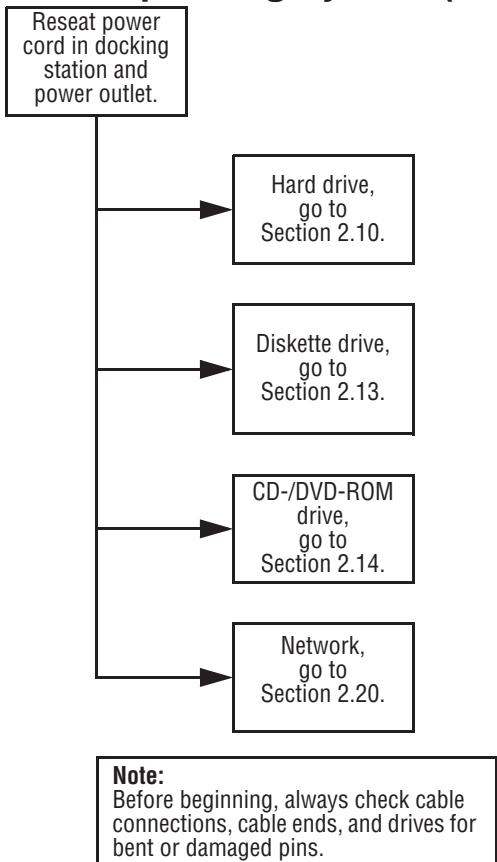
2.7 No Video, Part 2



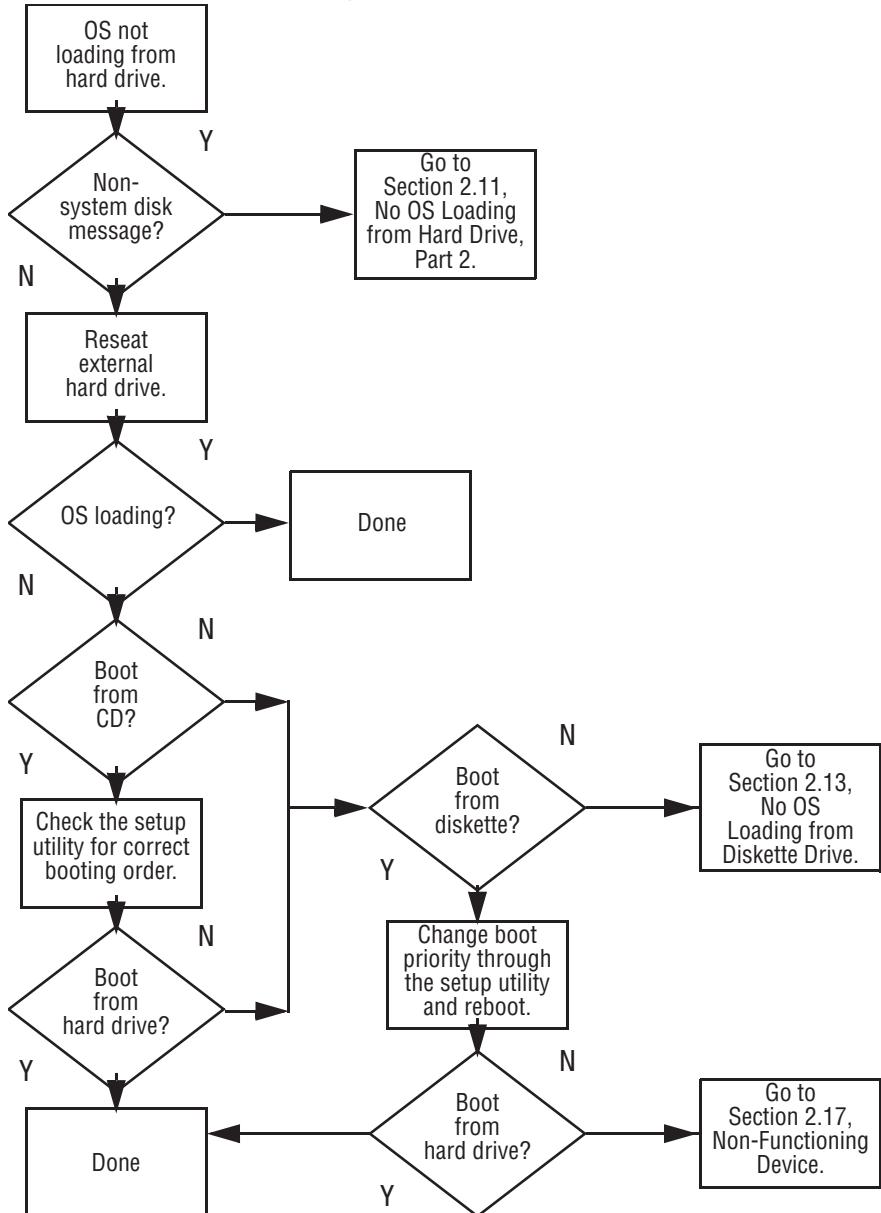
2.8 Non-Functioning Docking Station (if applicable)



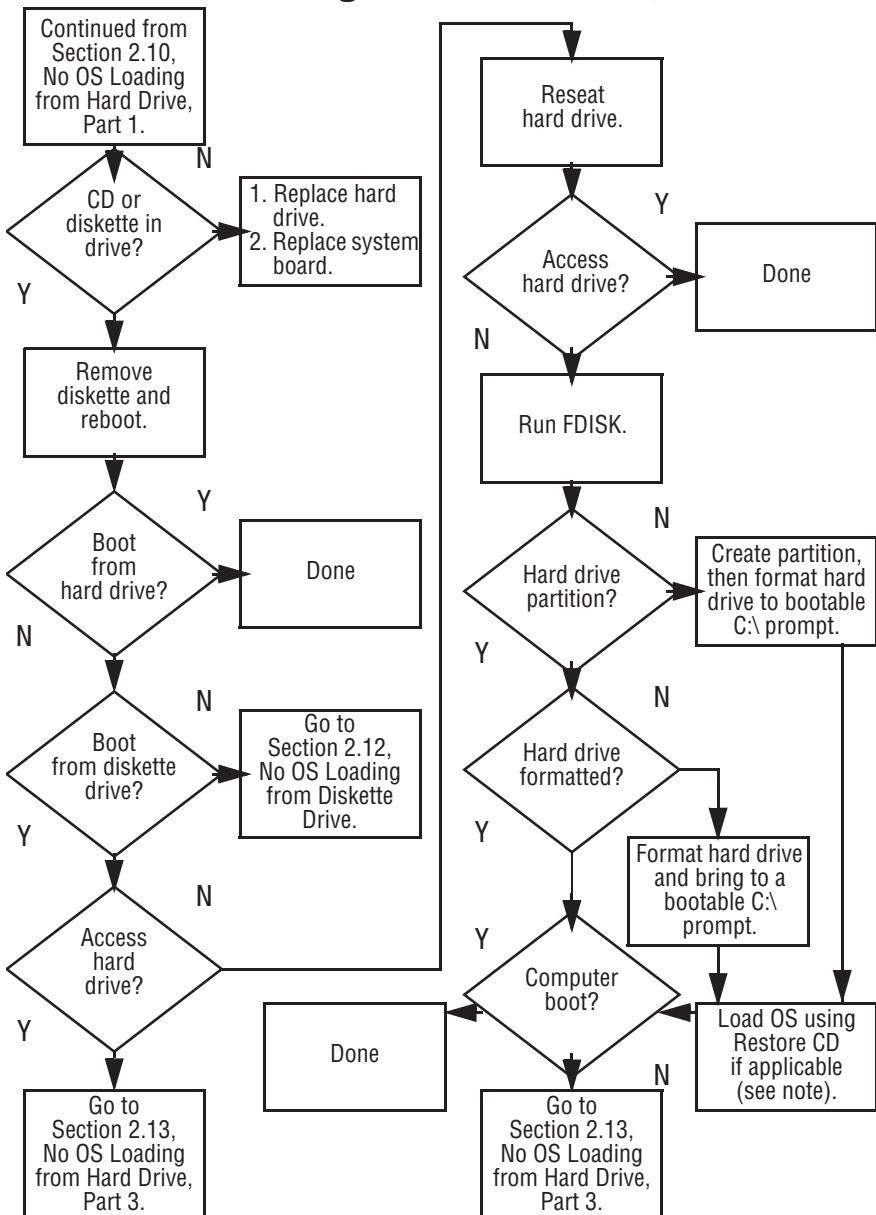
2.9 No Operating System (OS) Loading



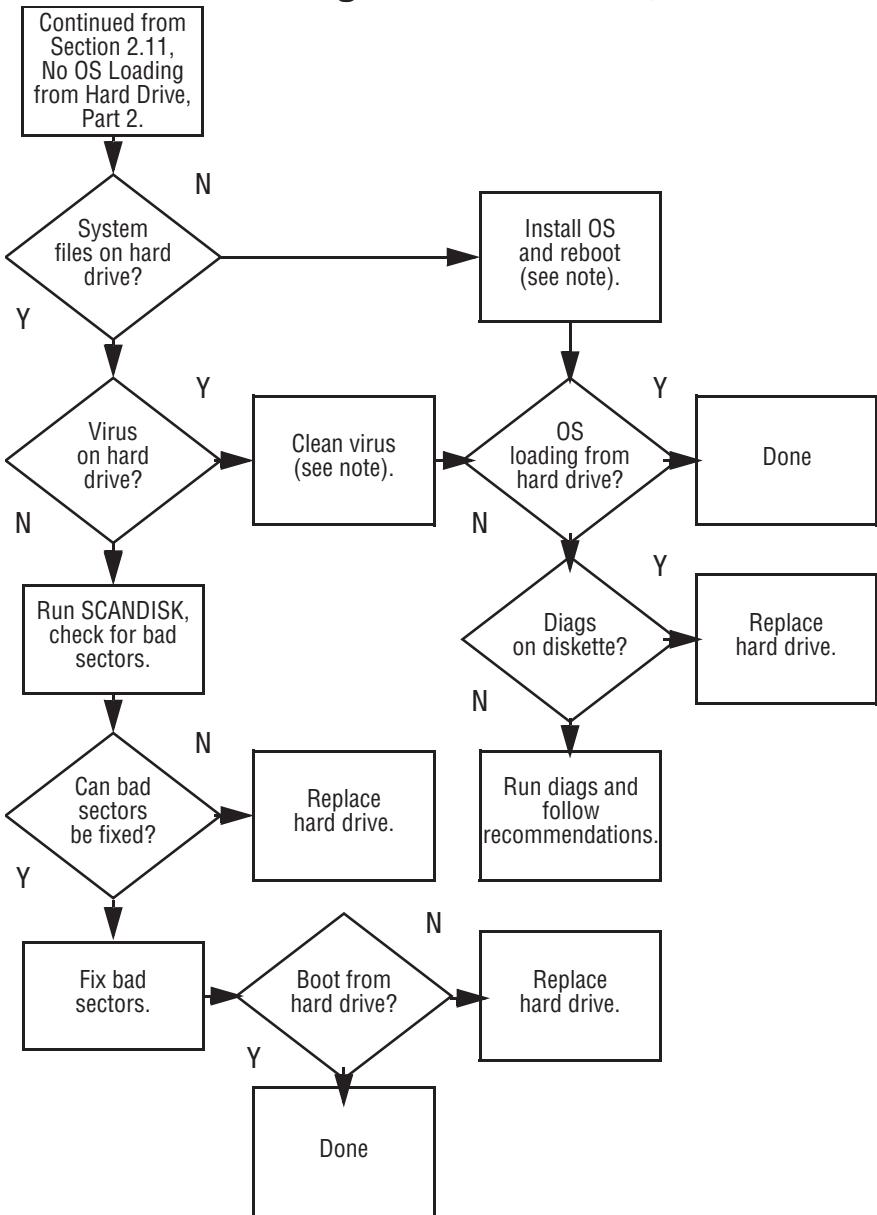
2.10 No OS Loading from Hard Drive, Part 1



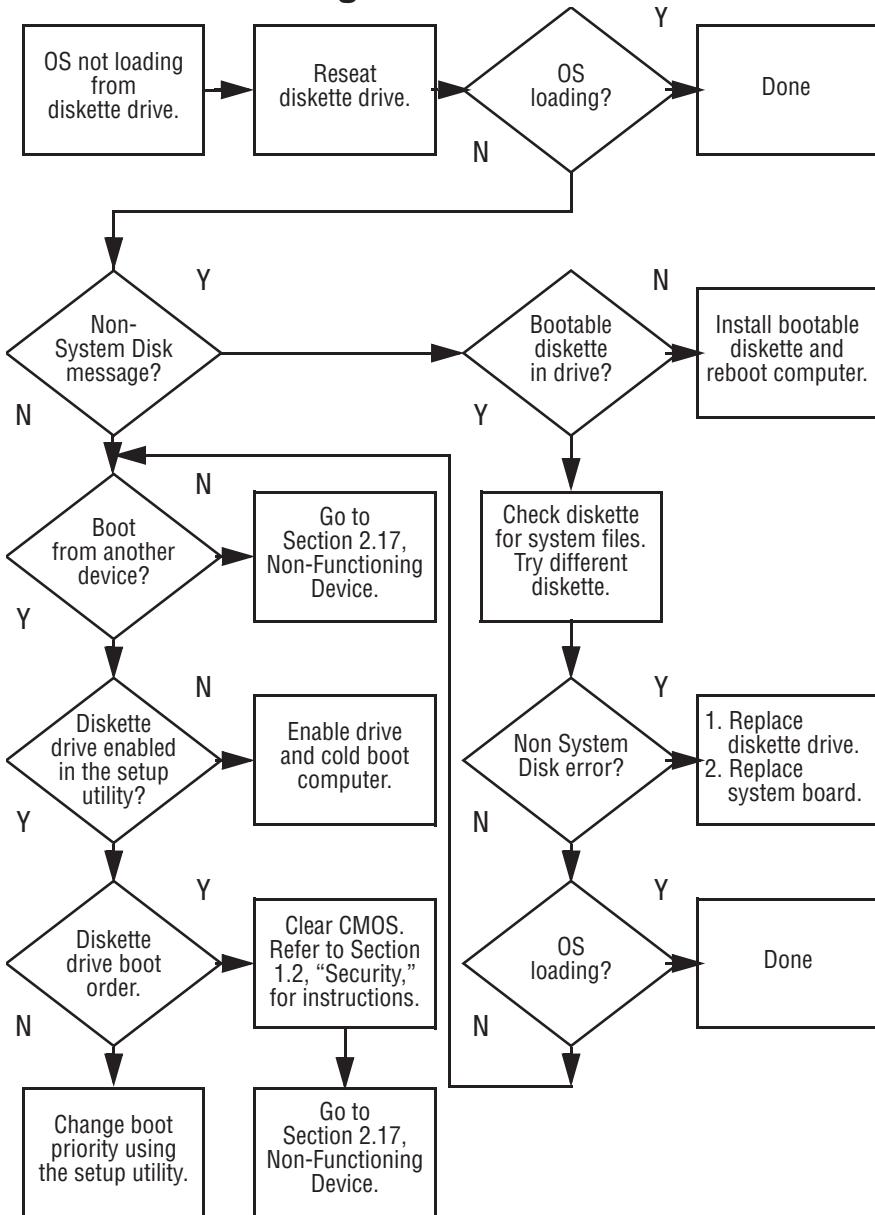
2.11 No OS Loading from Hard Drive, Part 2



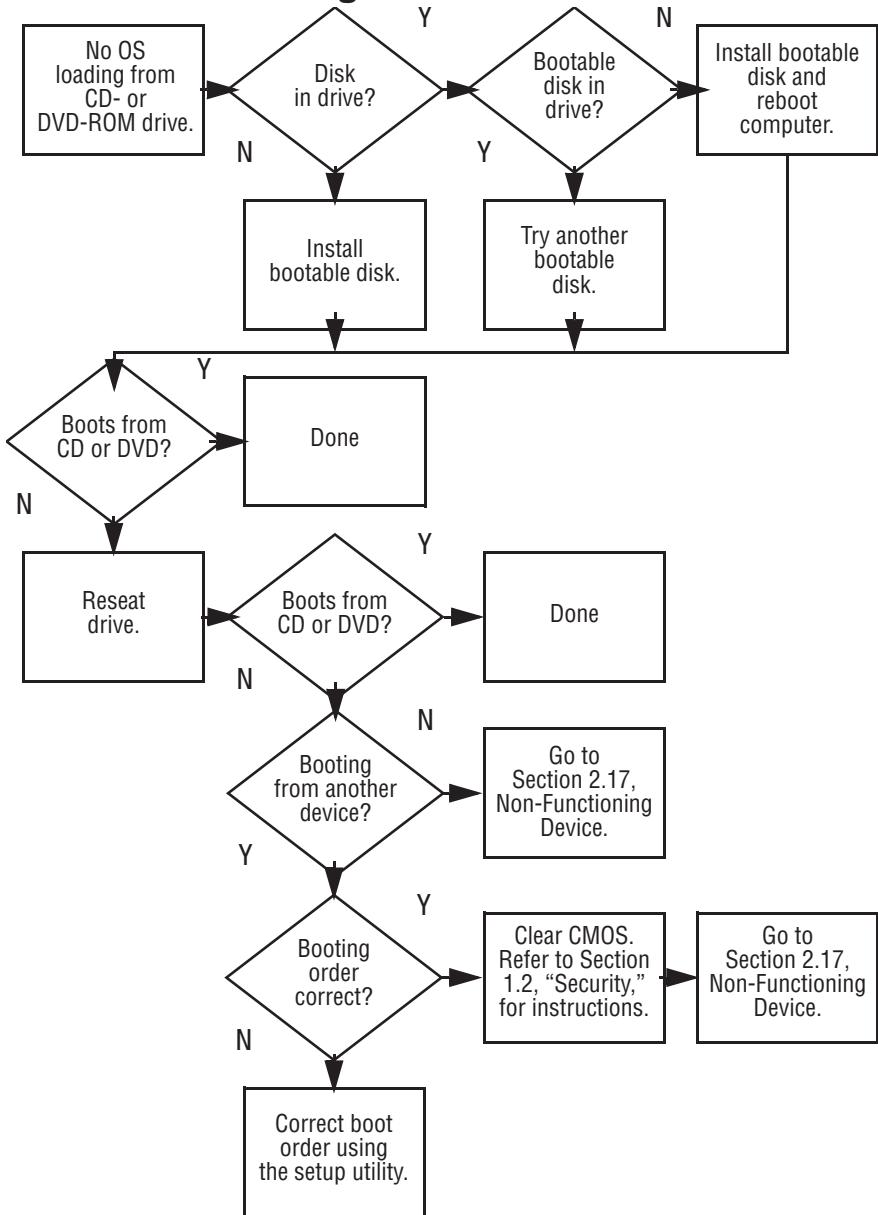
2.12 No OS Loading from Hard Drive, Part 3



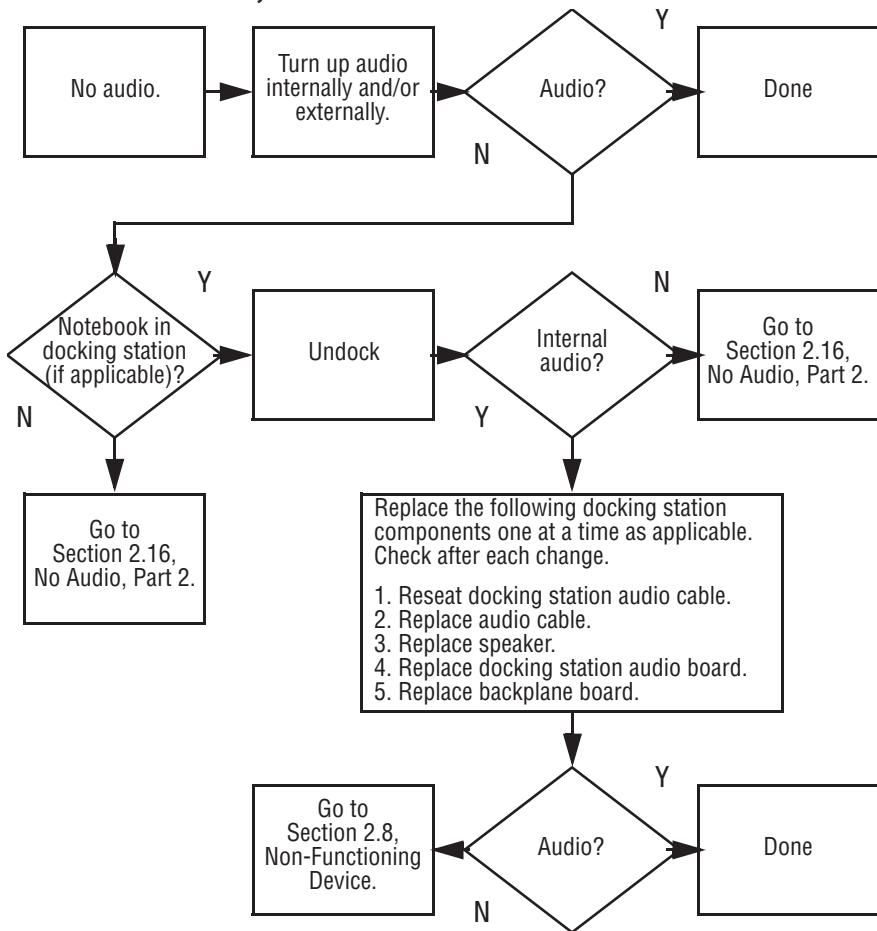
2.13 No OS Loading from Diskette Drive



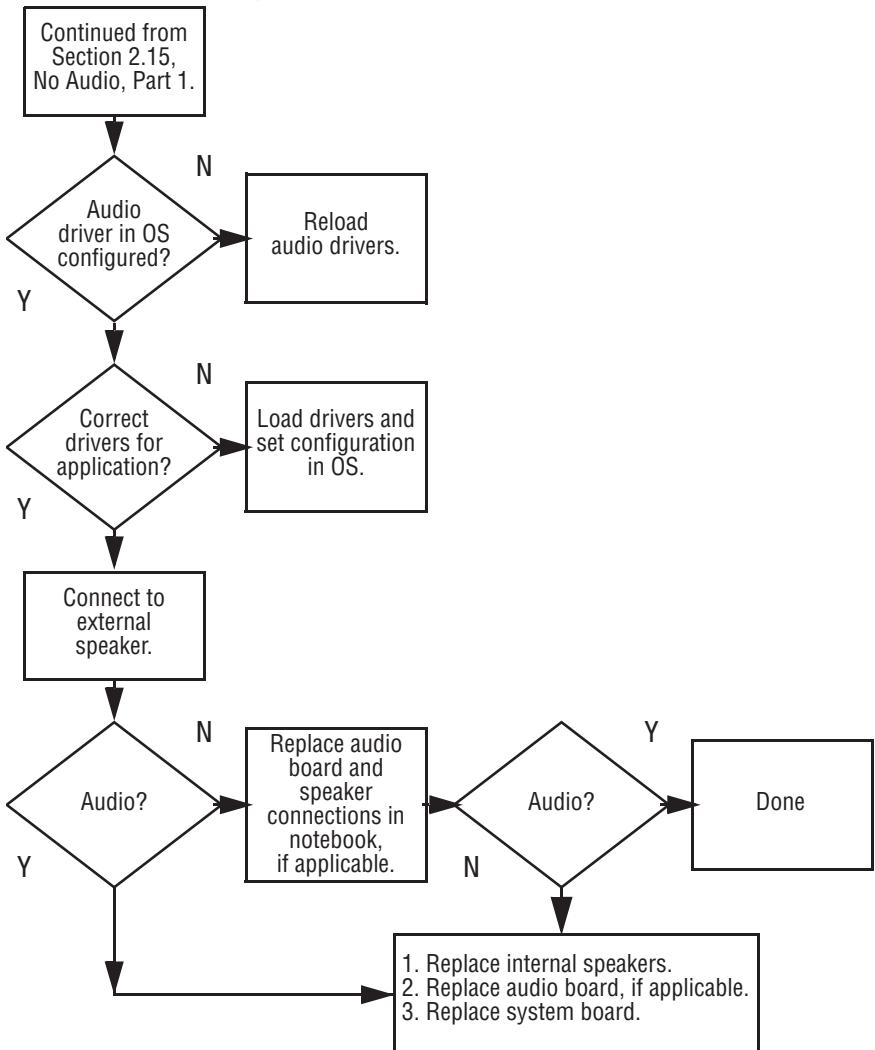
2.14 No OS Loading from CD- or DVD-ROM Drive



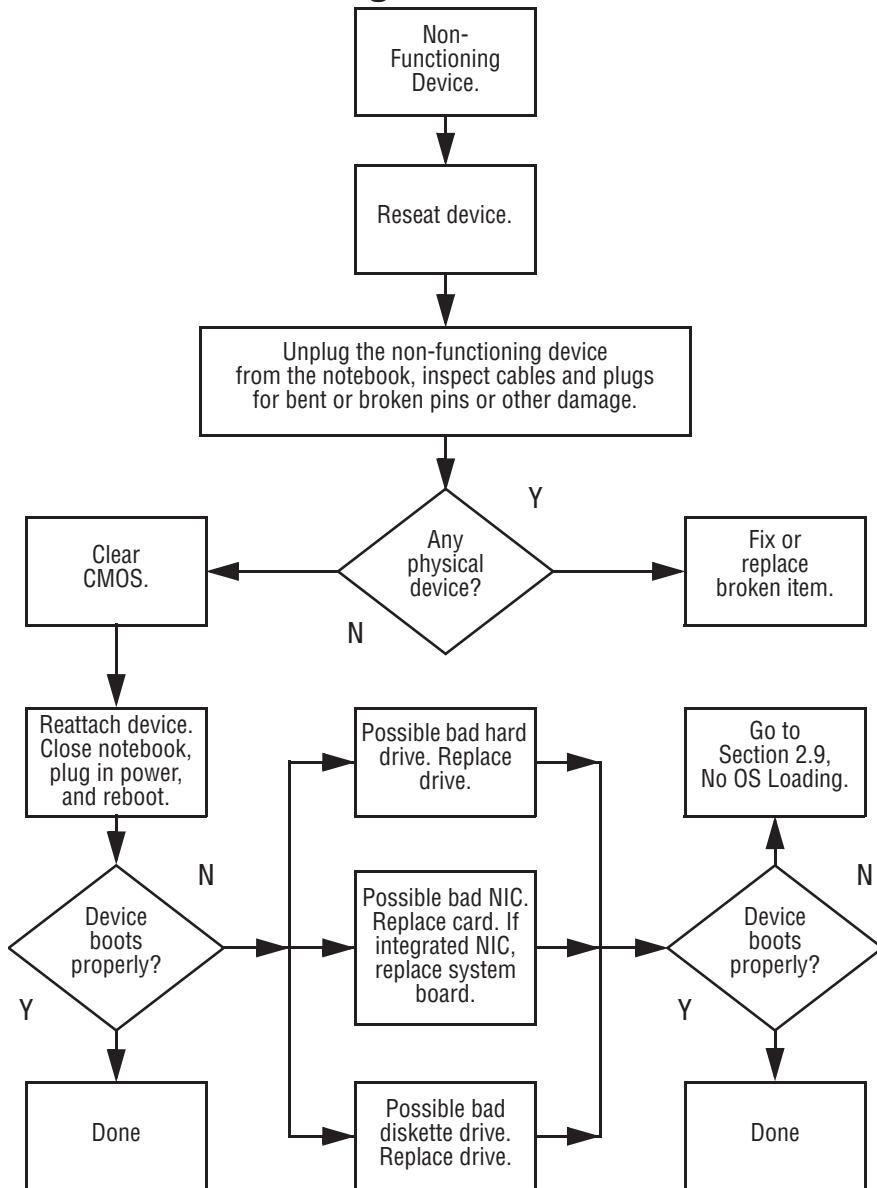
2.15 No Audio, Part 1



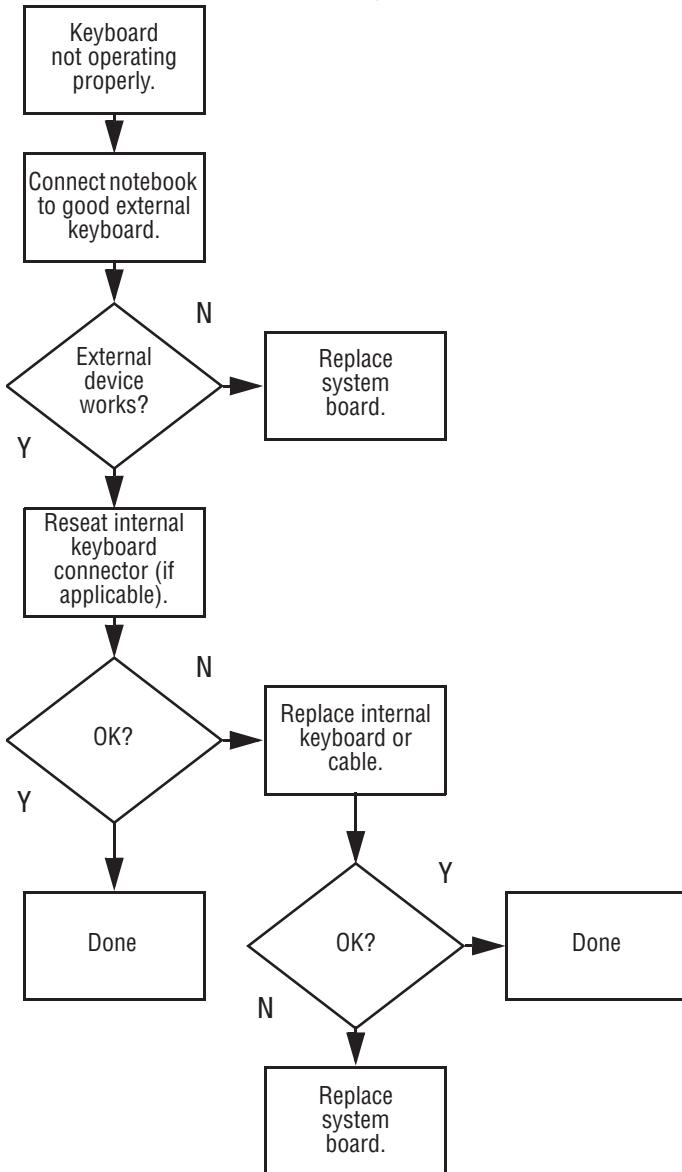
2.16 No Audio, Part 2



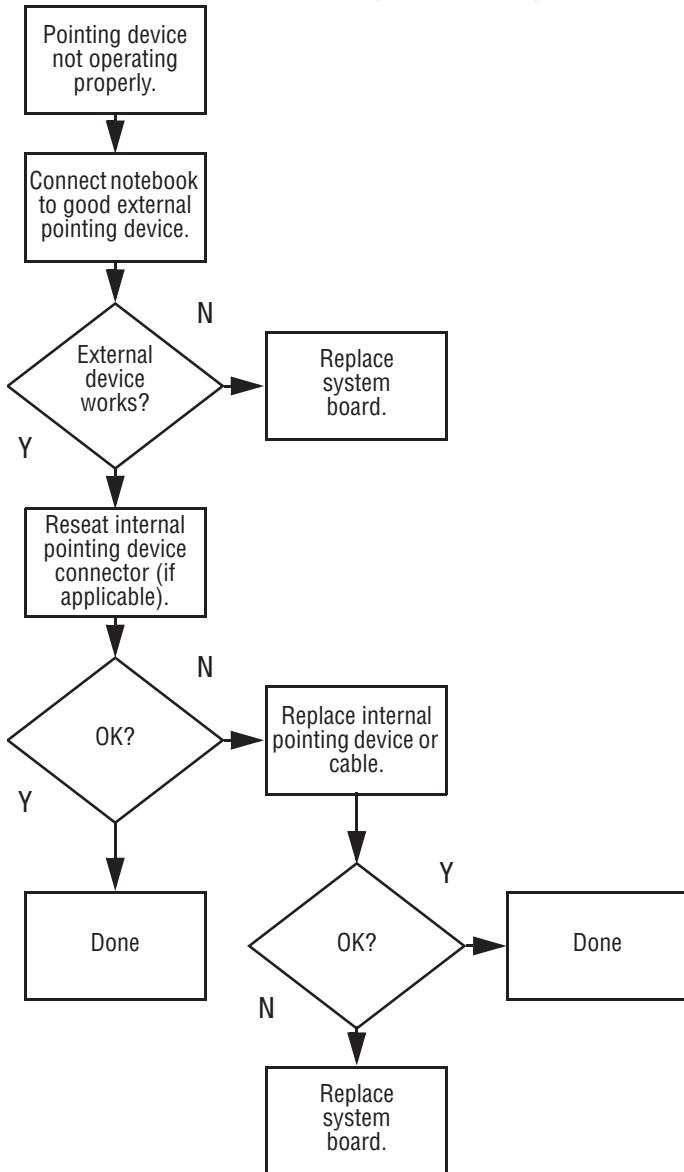
2.17 Non-Functioning Device



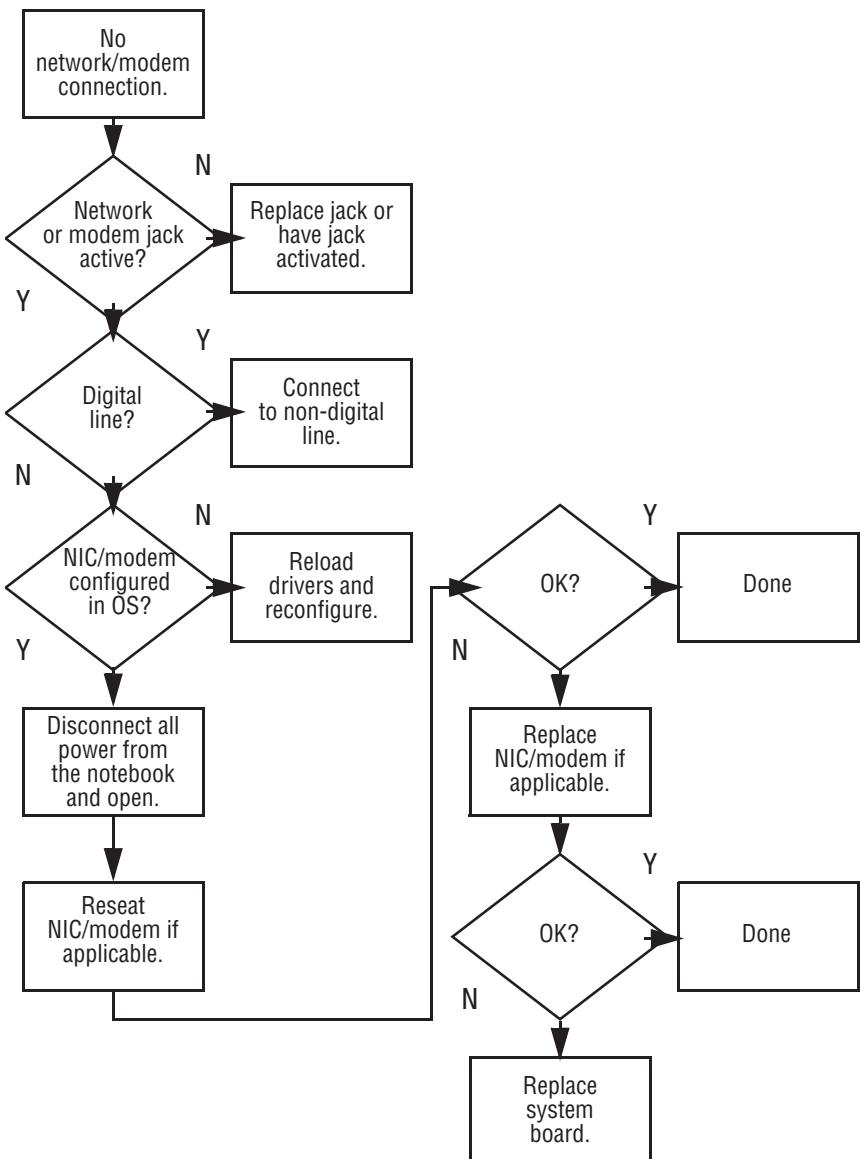
2.18 Non-Functioning Keyboard



2.19 Non-Functioning Pointing Device



2.20 Network or Modem Connection



Illustrated Parts Catalog

This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers.

3.1 Serial Number Location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer (Figure 3-1).

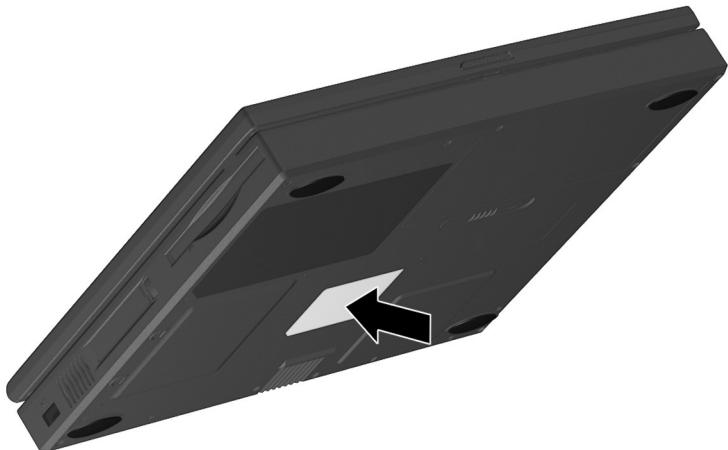


Figure 3–1: Serial Number Location

3.2 Computer System Major Components

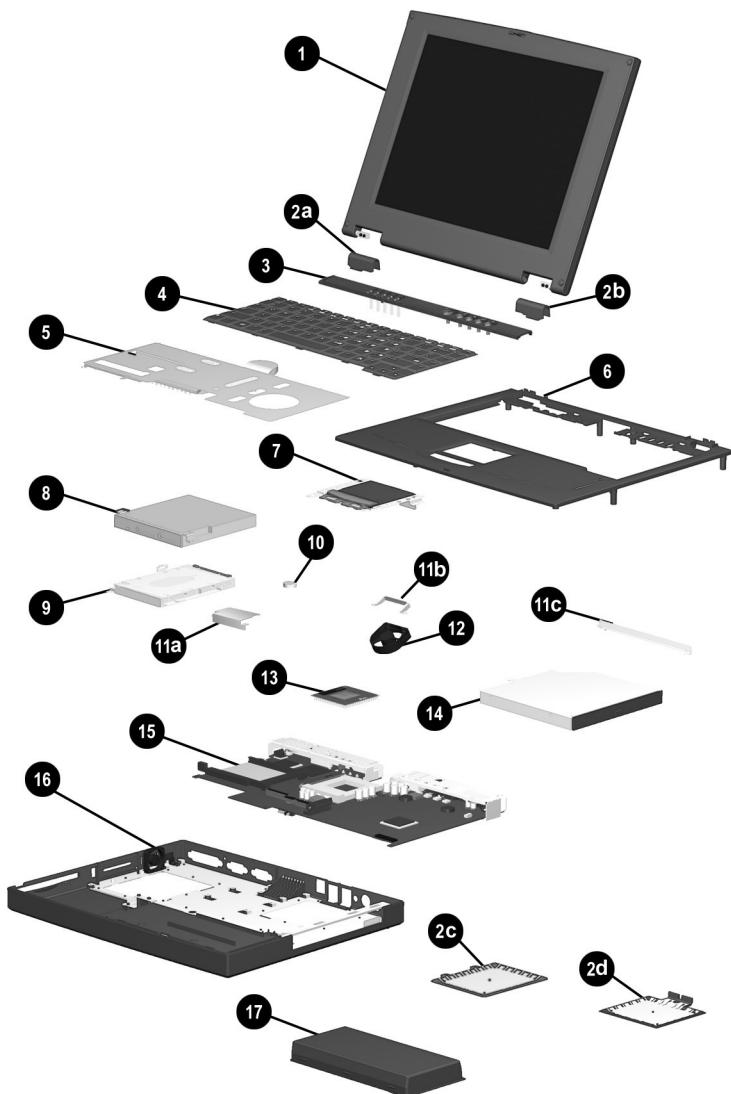
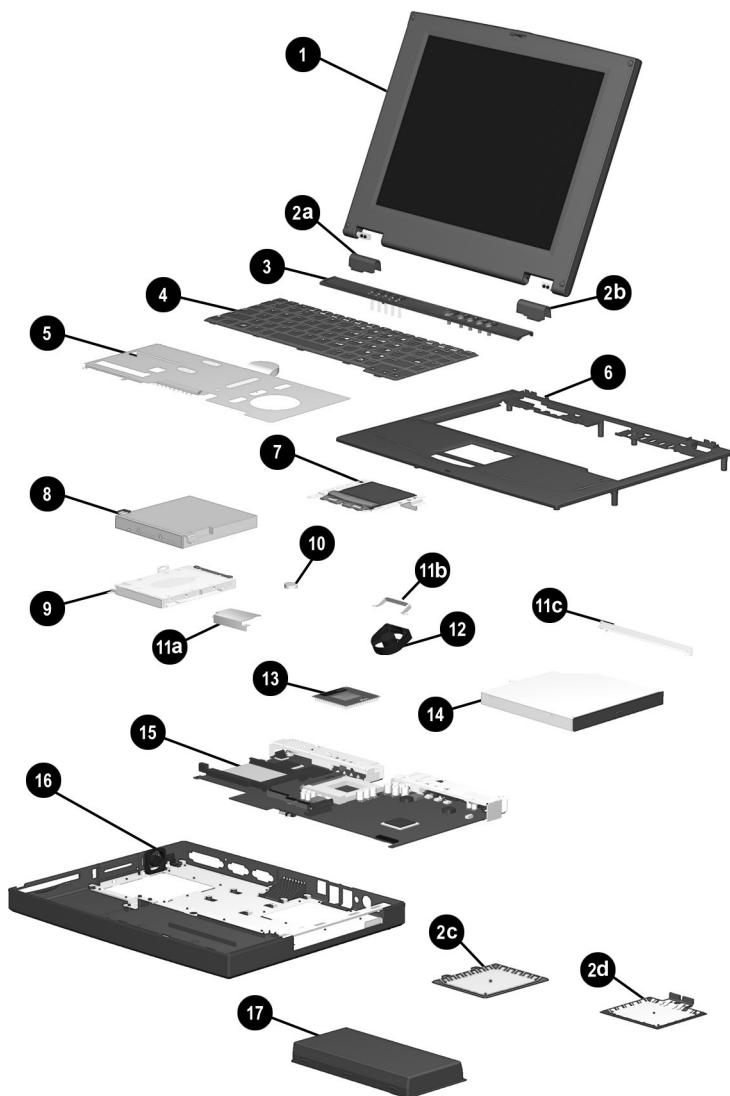


Figure 3–2: Computer System Major Components

Table 3-1
Spare Parts: Computer System Major Components

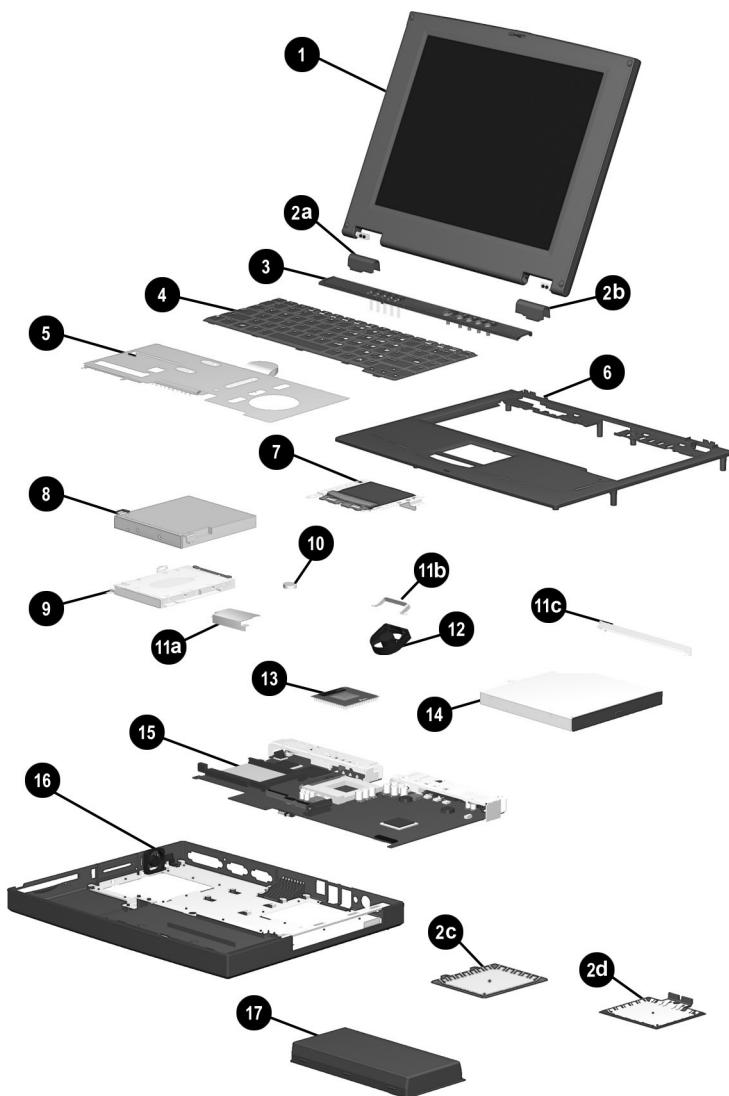
| Item | Description | Spare Part Number | | |
|------|--|-------------------|----------------|------------|
| 1 | Displays | | | |
| | 14.1-inch, XGA, CTFT (used only with computer models with 1.0-GHz processors) | 269909-001 | | |
| | 14.1-inch, XGA, CTFT (used only with computer models with 850-, 800-, and 700-MHz processors) | 233545-001 | | |
| | 12.1-inch, SVGA, CTFT (used only with computer models with 850-, 800-, and 700-MHz processors) | 233544-001 | | |
| | Plastics Kit | 233562-001 | | |
| 2a | Left hinge cover | not illustrated: | | |
| 2b | Right hinge cover | Computer feet | | |
| 2c | Memory expansion compartment cover | RJ-45 cover | | |
| 2d | Mini PCI slot cover | RJ-11 cover | | |
| 3 | LED cover | 233559-001 | | |
| 4 | Keyboard | | | |
| | Arabic | 233740-171 | Korean | 233740-AD1 |
| | Belgian | 233740-381 | Latin American | |
| | Czech | 233740-221 | Spanish | 233740-161 |
| | Danish | 233740-081 | Norwegian | 233740-091 |
| | French | 233740-051 | Portuguese | 233740-131 |
| | French | | Russian | 233740-251 |
| | Canadian | 233740-121 | Spanish | 233740-071 |
| | German | 233740-041 | Swedish | 233740-101 |
| | Hebrew | 233740-BB1 | Swiss | 233740-BF1 |
| | Hungarian | 233740-211 | Taiwanese | 233740-AB1 |
| | International | 233740-002 | Turkish | 233740-141 |
| | Italian | 233740-061 | U.K. English | 233740-031 |
| | Japanese | 233740-291 | U.S. English | 233740-001 |



Computer System Major Components (continued)

Table 3-1
Spare Parts: Computer System Major Components (Continued)

| Item | Description | Spare Part Number |
|------|--|--|
| 5 | Heat sink (used only with computer models with 1.0-GHz processors) Heat sink (used only with computer models with 850-, 800-, and 700-MHz processors) When replacing the heat sink, you must install a new thermal pad. Refer to Section 5.9, "Heat Sink," for instructions on thermal pad installation. | 269863-001 233555-001 |
| 6 | Top cover | 233568-001 |
| 7 | TouchPad | 236076-001 |
| 8 | Diskette drive | 233553-001 |
| 9 | Hard drives 20 GB 15 GB 10 GB (hard drive bracket spared in Hardware Kit, spare part number 234005-001) | 253596-001 253595-001 233554-001 |
| 10 | Disk cell RTC battery | 236359-001 |
| | Hardware Kit | 234005-001 |
| 11a | Hard drive bracket | |
| 11b | Fan bracket | |
| 11c | Optical drive alignment rail | |
| 12 | Fan (fan bracket spared in Hardware Kit, item 11, spare part number 234005-001) | 233552-001 |



Computer System Major Components (continued)

Table 3-1
Spare Parts: Computer System Major Components (Continued)

| Item | Description | Spare Part Number |
|------|--|-------------------|
| 13 | Processors | |
| | 1.0 GHz Intel Pentium III | 269861-001 |
| | 1.0 GHz Intel Celeron | 269862-001 |
| | 850 MHz Intel Pentium III | 253593-001 |
| | 850 MHZ Intel Celeron | 253594-001 |
| | 800 MHz Intel Pentium III | 233551-001 |
| | 700 MHz Intel Celeron | 233549-001 |
| 14 | Optical drives (optical drive alignment rail spared in Hardware kit, item 11, spare part number 234005-001) | |
| | 24X Max CD-ROM drive | 233550-001 |
| | 8X Max DVD-ROM drive | 233548-001 |
| 15 | System board (includes 64 MB SDRAM, left and right speakers, and left and right brackets) | 233567-001 |
| 16 | Base enclosure | 233547-001 |
| 17 | Battery packs | |
| | 9 cell Lithium ion (Li ion) | 231964-001 |
| | 9 cell Nickel Metal Hydride (Ni MH) | 231965-001 |

3.3 Plastics Kit Components

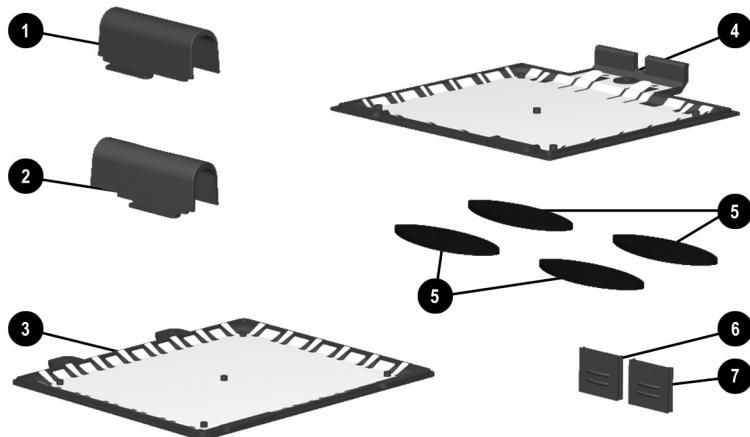


Figure 3–3: Plastics Kit Components

Table 3-2
Plastics Kit Components
Spare Part Number 233562-001

Item Description

- | | |
|---|------------------------------------|
| 1 | Left hinge cover |
| 2 | Right hinge cover |
| 3 | Memory expansion compartment cover |
| 4 | Mini PCI slot cover |
| 5 | Computer feet |
| 6 | RJ-45 cover |
| 7 | RJ-11 cover |
-

3.4 Hardware Kit Components

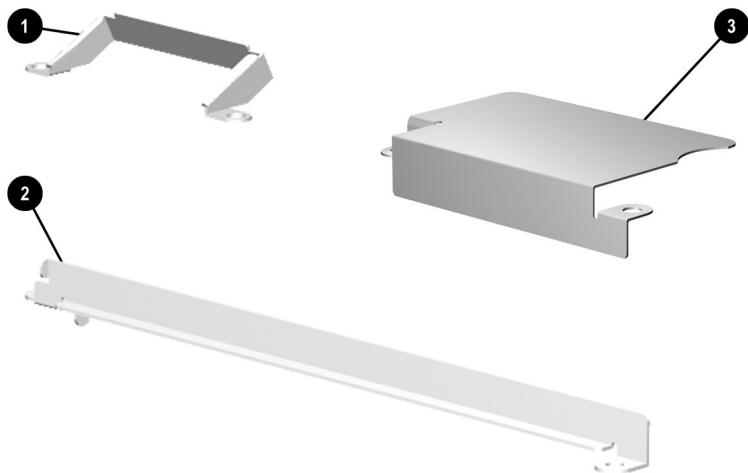


Figure 3–4: Hardware Kit Components

Table 3-3
Hardware Kit Components
Spare Part Number 234005-001

| Item | Description |
|------|------------------------------|
| 1 | Fan bracket |
| 2 | Optical drive alignment rail |
| 3 | Hard drive bracket |

3.5 Cable Kit Components

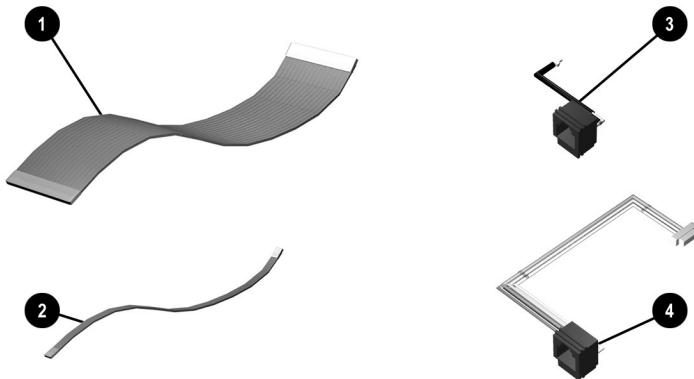


Figure 3-5: Cable Kit Components

Table 3-4
Cable Kit Components
Spare Part Number 234006-001

| Item | Description |
|------|--------------------------|
| 1 | Diskette drive cable (2) |
| 2 | TouchPad cable |
| 3 | RJ-11 cable |
| 4 | RJ-45 cable |

3.6 Mass Storage Devices

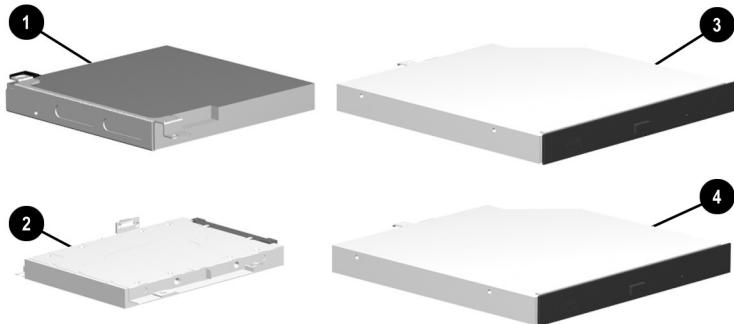


Figure 3–6: Mass Storage Devices

Table 3-5
Mass Storage Devices

| Item | Description | Spare Part Number |
|------|--|-------------------|
| 1 | Diskette drive | 233553-001 |
| 2 | Hard drives | |
| | 20 GB | 253596-001 |
| | 15 GB | 253595-001 |
| | 10 GB | 233554-001 |
| | (hard drive bracket spared in Hardware Kit, spare part number 234005-001) | |
| 3 | 24X Max CD-ROM drive | 233550-001 |
| 4 | 8X Max DVD-ROM drive | 233548-001 |

3.7 Miscellaneous

Table 3-6
Spare Parts: Miscellaneous (not illustrated)

| Description | Spare Part Number | | |
|--|-------------------|-----------|------------|
| Communication boards | | | |
| Type III mini PCI combination 56 Kbps modem/network interface card (NIC) | | | 233558-001 |
| Type III mini PCI 56 Kbps modem board | | | 233557-001 |
| PC Card modem | | | 233564-001 |
| Modem adapters | | | |
| Czech | 234963-221 | Norwegian | 234963-091 |
| German | 236432-041 | Swiss | 198294-111 |
| Hungarian | 234963-211 | | |
| Modem cable | | | 234962-001 |
| Modem cable adapters | | | |
| Australian | | | 304398-011 |
| Belgian | | | 304398-181 |
| French | | | 304398-051 |
| RJ-11 P55 adapters | | | |
| Danish | 316904-081 | Italian | 316904-061 |
| Finnish | 316904-351 | Swedish | 316904-101 |
| RJ-11 PTT adapter (used in the United Kingdom) | | | 158593-031 |
| RJ-45 network cable | | | 237672-001 |

Table 3-6
Spare Parts: Miscellaneous (not illustrated) (Continued)

| Description | Spare Part Number |
|--|-------------------|
| External AC adapter | 163444-001 |
| 50W slim AC adapter | 163444-291 |
| Logo kit | 233556-001 |
| Memory expansion boards | |
| 128 MB at 133 MHz | 212682-001 |
| 64 MB at 133 MHz | 212681-001 |
| 256 MB at 100 MHz | 167136-001 |
| 128 MB at 100 MHz | 135244-001 |
| 64 MB at 100 MHz | 135243-001 |
| Screw kit (includes M2.5 x 7, M2.5 x 5.5, M2.5 x 5, and M2.5 x 4.5 screws; refer to Appendix C, "Screw Listing," for more information on screw specifications and usage) | 233565-001 |
| Power cord, black, 6 feet | |
| Australian | 246959-011 |
| Danish | 246959-081 |
| European/Middle Eastern/African | 246959-021 |
| Italian | 213352-001 |
| Japanese | 197233-001 |
| Korean | 246959-AD1 |
| Swiss | 246959-AG1 |
| Taiwanese | 234961-AA1 |
| U.K. English | 246959-031 |
| U.S. English | 246959-001 |

Removal and Replacement Preliminaries

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

You will need the following tools to complete the removal and replacement procedures:

- Magnetic screwdriver
- Phillips P0 screwdriver
- Tool kit (includes connector removal tool, loopback plugs, and case utility tool)

4.2 Service Considerations

Listed below are some of the considerations that you should keep in mind during disassembly and assembly procedures.



As you remove each subassembly from the computer, place it (and all accompanying screws) away from the work area to prevent damage.

Plastic Parts

Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and Connectors

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Ensure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; they tear easily.



CAUTION: When servicing the computer, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can damage the computer.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a removable drive, or loss of information, observe these precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, then shut it down.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. Ensure that the optical drive tray is closed.

- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces that have at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, CD-ROM drive, or a diskette drive, place it into a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or to liquids.
- If a drive must be mailed, do the following: place the drive into a bubble pack mailer or other suitable form of protective packaging; label the package “Fragile: Handle With Care.”

4.4 Preventing Electrostatic Damage

Many electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge may not be affected at all and can work perfectly throughout a normal cycle. It may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.

- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or non-conductive foam.
- Use transporters and conveyers made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground, and that proper materials were selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-dissipative material (refer to Table 4-2).
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When using fixtures that must directly contact dissipative surfaces, use fixtures made of static-safe materials only.
- Keep the work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle them only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snug against the skin at all times. On grounded mats with banana-plug connectors, connect a wrist strap with alligator clips.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a minimum of one-megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.
- Other grounding equipment recommended for use in preventing electrostatic damage includes:
 - Antistatic tape
 - Antistatic smocks, aprons, or sleeve protectors
 - Conductive bins and other assembly or soldering aids
 - Non-conductive foam
 - Conductive tabletop workstations with ground cord of one-megohm resistance
 - Static-dissipative table or floor mats with hard tie to ground
 - Field service kits
 - Static awareness labels
 - Material-handling packages

- Non-conductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 4-1
Typical Electrostatic Voltage Levels

| Event | Relative Humidity | | |
|---------------------------------|-------------------|----------|---------|
| | 10% | 40% | 55% |
| Walking across carpet | 35,000 V | 15,000 V | 7,500 V |
| Walking across vinyl floor | 12,000 V | 5,000 V | 3,000 V |
| Motions of bench worker | 6,000 V | 800 V | 400 V |
| Removing DIPS from plastic tube | 2,000 V | 700 V | 400 V |
| Removing DIPS from vinyl tray | 11,500 V | 4,000 V | 2,000 V |
| Removing DIPS from Styrofoam | 14,500 V | 5,000 V | 3,500 V |
| Removing bubble pack from PCB | 26,500 V | 20,000 V | 7,000 V |
| Packing PCBs in foam-lined box | 21,000 V | 11,000 V | 5,000 V |



A product can be degraded by as little as 700 volts.

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2
Static-Shielding Materials

| Material | Use | Voltage Protection Level |
|-----------------------|------------|--------------------------|
| Antistatic plastic | Bags | 1,500 V |
| Carbon-loaded plastic | Floor mats | 7,500 V |
| Metallized laminate | Floor mats | 5,000 V |

Removal and Replacement Procedures

This chapter provides removal and replacement procedures.

All screws removed during disassembly are P0 Phillips screws. There are four different sized screws that must be removed and replaced when servicing the computer. Make special note of the size and location of each screw during removal and replacement.

Refer to Appendix C, “Screw Listing,” for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

Report the computer serial number to Compaq when requesting information or ordering spare parts. The serial number is located on the bottom of the computer (Figure 5-1).

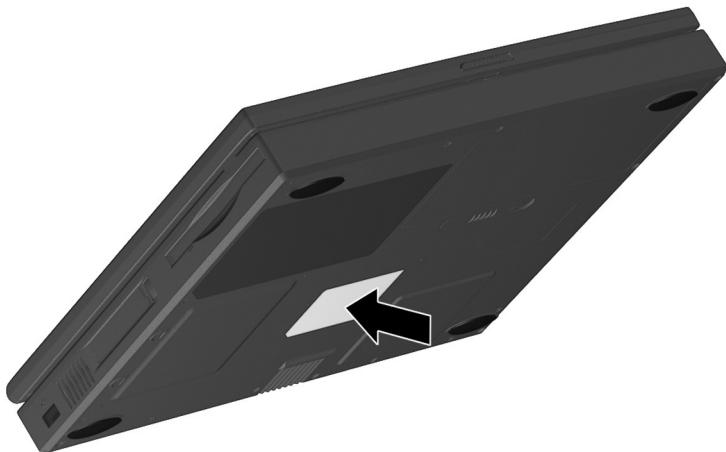


Figure 5–1: Serial Number Location

5.2 Disassembly Sequence Chart

Use the chart below to determine the section number to be referenced when removing computer components.

Table 5-1
Disassembly Sequence Chart

| Section | Description | # of Screws Removed |
|----------------|--|----------------------------|
| 5.3 | Preparing the computer for disassembly | 0 |
| 5.4 | Computer feet | 0 |
| 5.5 | Mini PCI Communications Board | 1 |
| 5.6 | LED cover | 0 |
| 5.7 | Keyboard | 2 |
| 5.8 | Optical drive | 1 |
| 5.9 | Display | 7 |
| 5.10 | Heat sink | 5 |
| 5.11 | Processor | 0 |
| 5.12 | Top cover | 15 |
| 5.13 | Diskette drive | 2 |
| 5.14 | TouchPad | 1 |
| 5.15 | Hard drive Hard drive bracket | 3 |
| 5.16 | Disk cell Real Time Clock (RTC) battery | 0 |
| 5.17 | Fan Fan bracket | 2 |
| 5.18 | System board Optical drive alignment rail | 7 |

5.3 Preparing the Computer for Disassembly

Perform the following steps before disassembling the computer. Consult the computer *Hardware Guide* for instructions on the following steps:

1. Turn off the computer.
2. Disconnect the AC Adapter and all external devices.
3. Remove any battery packs inserted into the computer.
4. Remove the memory expansion compartment cover.

5.4 Computer Feet

The computer feet are adhesive-backed rubber pads. The computer feet are included in the Plastics Kit (spare part number 233562-001). Refer to Figure 5-2 for the computer feet locations.

Computer Feet Spare Part Number Information

Plastics kit, includes:

- Left hinge cover
- Right hinge cover
- Mini PCI slot cover
- Memory expansion compartment cover

Spare part number 233562-001

- Computer feet
- RJ-45 cover
- RJ-11 cover

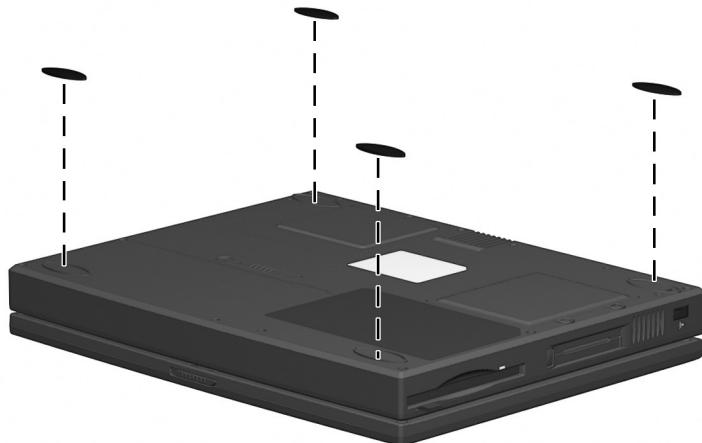


Figure 5–2: Replacing the Computer Feet

5.5 Mini PCI Communication Board

Communication Boards Spare Part Number Information

Communication boards

| | |
|--|------------|
| Type III mini PCI combination 56 Kbps modem/network interface card (NIC) | 233558-001 |
| Type III mini PCI 56 Kbps modem board | 233557-001 |
| PC Card modem | 233564-001 |

1. Prepare the computer for disassembly (Section 5.3).
2. Turn the computer bottom side up with the front facing you.
3. Remove the screws ① that secure the mini PCI compartment cover to the base enclosure (Figure 5-3).
4. Lift up the front edge of the cover and swing it toward the computer rear panel ②.

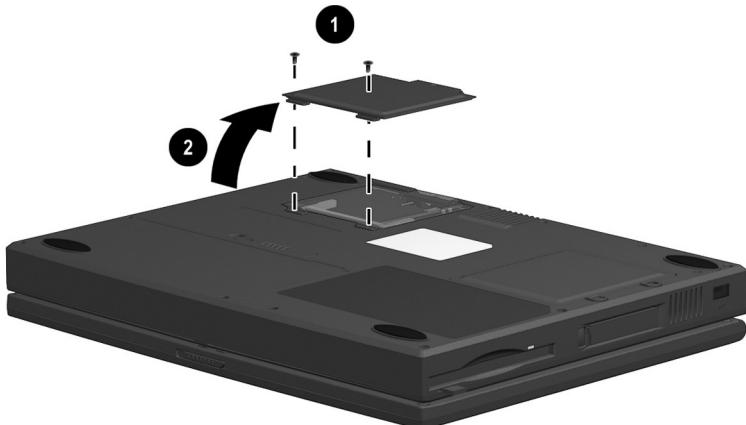


Figure 5–3: Removing the Mini PCI Compartment Cover

5. Remove the mini PCI compartment cover.
6. Pull away the plastic retention clips on each side of the mini PCI communication board ① (Figure 5-4). The board tilts upward.
7. Lift the edge of the board and slide it gently out of the connector ②.

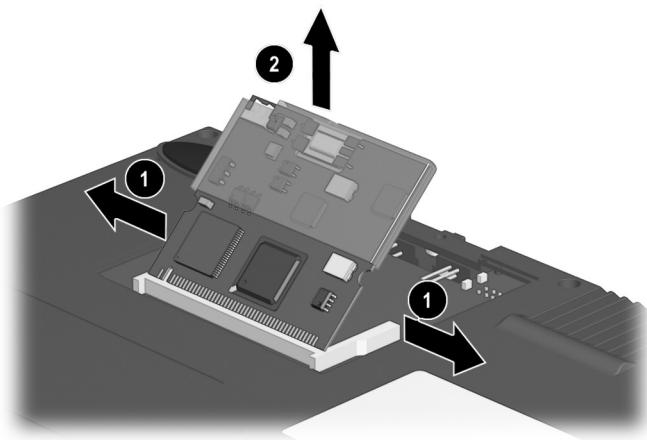


Figure 5–4: Removing the Mini PCI Communication Board

8. Place the board in an electrostatic-safe container.
- Reverse the above procedure to install the mini PCI communication board.

5.6 LED Cover

LED Cover Spare Part Number Information

LED cover

233559-001

1. Prepare the computer for disassembly (Section 5.3).
2. Turn the computer top side up with the front facing you.
3. Open the computer.
4. Lift up the left edge of the LED cover ① (Figure 5-5).
5. Lift up the front edge of the LED cover from left to right ②.
6. Lift the LED cover straight up to remove it.

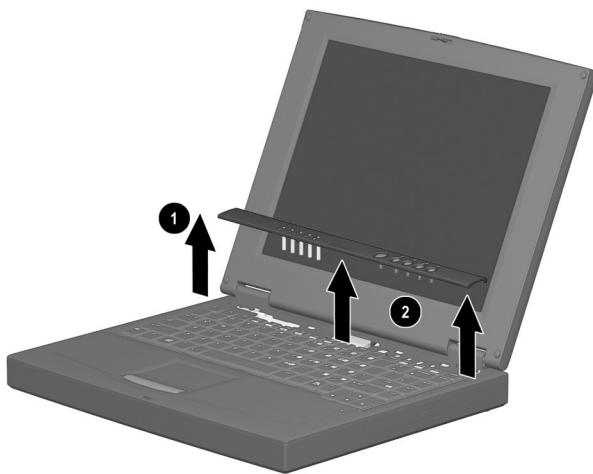


Figure 5-5: Removing the LED Cover

Reverse the above procedure to install the LED cover.

5.7 Keyboard

Keyboard Spare Part Number Information

Keyboards

| | | | |
|-----------------|------------|------------------------|------------|
| Arabic | 233740-171 | Korean | 233740-AD1 |
| Belgian | 233740-381 | Latin American Spanish | 233740-161 |
| Czech | 233740-221 | Norwegian | 233740-091 |
| Danish | 233740-081 | Portuguese | 233740-131 |
| French | 233740-051 | Russian | 233740-251 |
| French Canadian | 233740-121 | Swedish | 233740-101 |
| German | 233740-041 | Swiss | 233740-BF1 |
| Hebrew | 233740-BB1 | Spanish | 233740-071 |
| Hungarian | 233740-211 | Taiwanese | 233740-AB1 |
| International | 233740-002 | Turkish | 233740-141 |
| Italian | 233740-061 | U.K. English | 233740-031 |
| Japanese | 233740-291 | U.S. English | 233740-001 |

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the LED cover (Section 5.6).

3. Remove the two M2.5 × 5 screws securing the keyboard to the base enclosure ① (Figure 5-6).
4. Swing the back edge of the keyboard up and forward ② until it rests on the top cover.

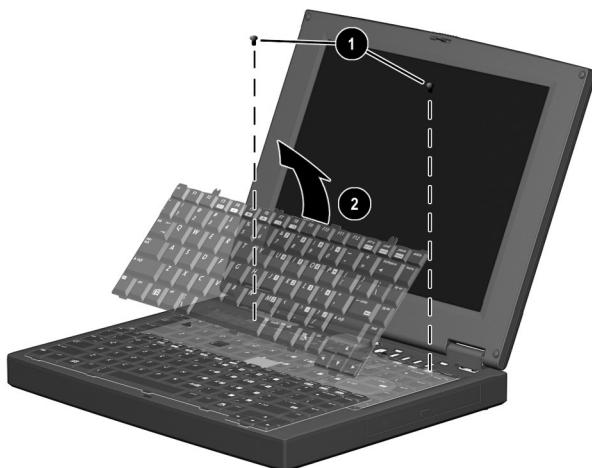


Figure 5–6: Removing the Keyboard Screws

5. Release the zero insertion force (ZIF) connector to which the keyboard cable is connected **1** and disconnect the keyboard cable from the system board **2** (Figure 5-7).

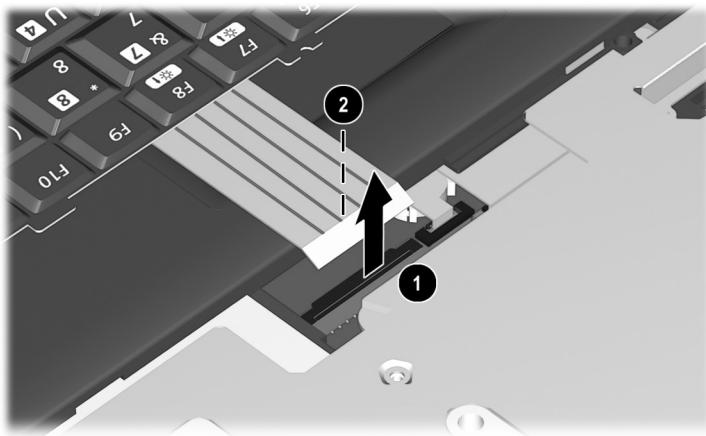


Figure 5–7: Disconnecting the Keyboard Cable

6. Remove the keyboard.

Reverse the above procedure to install the keyboard.

5.8 Optical Drive

Optical Drives Spare Part Number Information

Optical drives

| | |
|----------------------|------------|
| 24X Max CD-ROM drive | 233550-001 |
| 8X Max DVD-ROM drive | 233548-001 |

| | |
|--|------------|
| Optical drive alignment rail (included in Hardware kit) | 234005-001 |
|--|------------|

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
 - LED cover (Section 5.6)
 - Keyboard (Section 5.7)

2. Remove the M2.5 × 4.5 screw that secures the optical drive to the heat sink ① (Figure 5-8).
3. Push the back edge of the optical drive ② to the right to disconnect it from the connector on the system board.
4. Slide the optical drive out of the base enclosure ③.

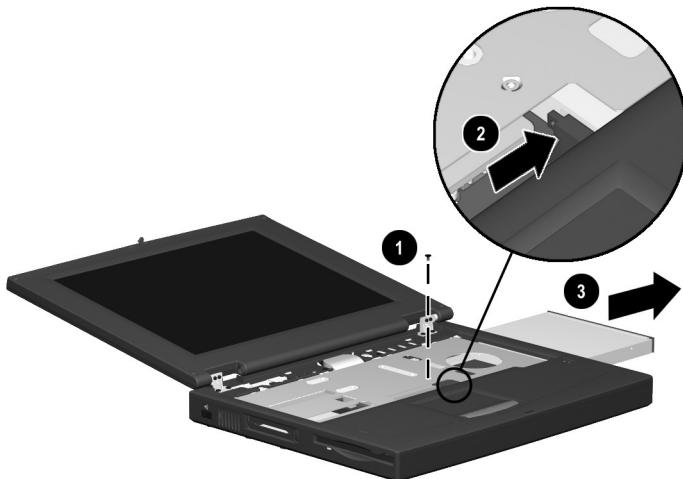


Figure 5–8: Removing the Optical Drive

Reverse the above procedure to install the optical drive.

5.9 Display

Display Spare Part Number Information

Displays

| | |
|--|------------|
| 14.1-inch, XGA, CTFT (used only with computer models with 1.0-GHz processors) | 269909-001 |
| 14.1-inch, XGA, CTFT (used only with computer models with 850-, 800-, and 700-MHz processors) | 233545-001 |
| 12.1-inch, SVGA, CTFT (used only with computer models with 850-, 800-, and 700-MHz processors) | 233544-001 |



When the display screws are removed, the display assembly is unsupported. Make sure to provide support for the display assembly when removing the display screws.

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
 - LED cover (Section 5.6)
 - Keyboard (Section 5.7)
2. Close the computer.
3. Position the computer with the rear panel facing you.

4. Remove the two M2.5 × 4.5 screws securing the hinge covers to the display hinges ① (Figure 5-9).
5. Lift the hinge covers straight up to remove them ②.

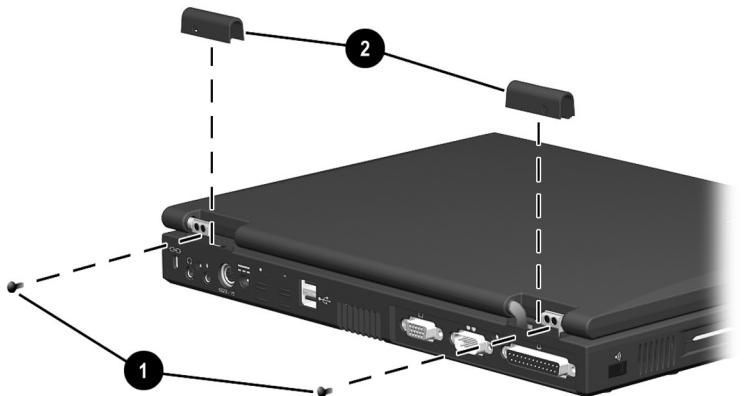


Figure 5–9: Removing the Hinge Covers



The right and left hinge covers are included in the Plastics Kit and are not interchangeable.

Hinge Covers Spare Part Number Information

Plastics kit, includes:

Left hinge cover
Right hinge cover
Mini PCI slot cover
Memory expansion compartment cover

Spare part number 233562-001

Computer feet
RJ-45 cover
RJ-11 cover

6. Position the computer with the front facing you.
7. Open the computer.
8. Remove the M2.5 × 4.5 screw securing the display ground cable to the base enclosure **1** (Figure 5–10).
9. Disconnect the display video cable **2**.
10. Remove the four M2.5 × 7 screws securing the display hinges to the base enclosure **3**.

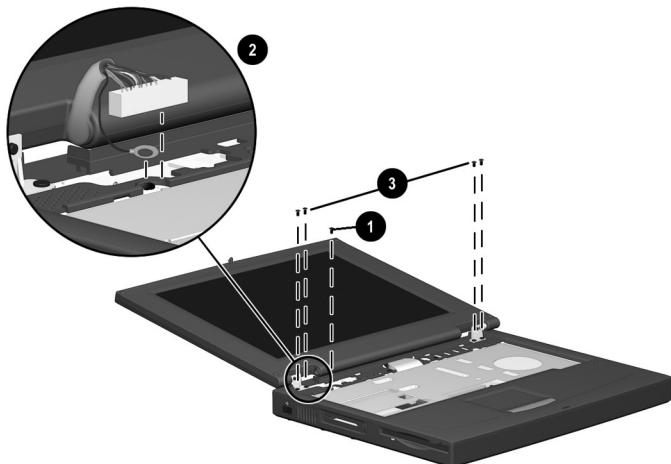


Figure 5–10: Removing the Display

11. Remove the display.

Reverse the above procedure to install the display.



To ensure proper alignment of the display when replacing it, loosely install the screws in the ①, ②, ③, ④, ⑤ sequence indicated in Figure 5–11. After all screws have been loosely installed, tighten them.

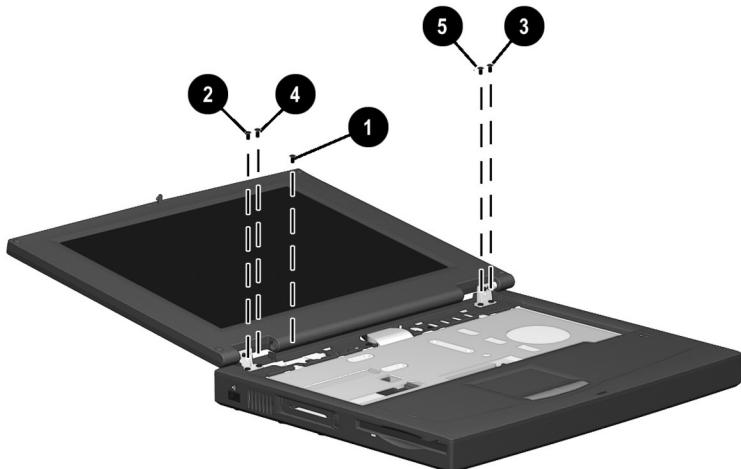


Figure 5–11: Installing the Display Screws

Reverse the above procedure to install the display.

5.10 Heat Sink

Heat Sink Spare Part Number Information

| | |
|---|------------|
| Heat sink (used only with computer models with 1.0-GHz processors) | 269863-001 |
| Heat sink (used only with computer models with 850-, 800-, and 700-MHz processors) | 233555-001 |

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- LED cover (Section 5.6)
 - Keyboard (Section 5.7)
 - Optical drive (Section 5.8)
 - Display (Section 5.9)
-



The heat sink is secured to the base enclosure by five screws that are two different sizes. Be sure to carefully note the size and location of each screw.

2. Remove the four M2.5 × 7 screws **1** and the M2.5 × 4.5 screw **2** securing the heat sink to the base enclosure (Figure 5-12).

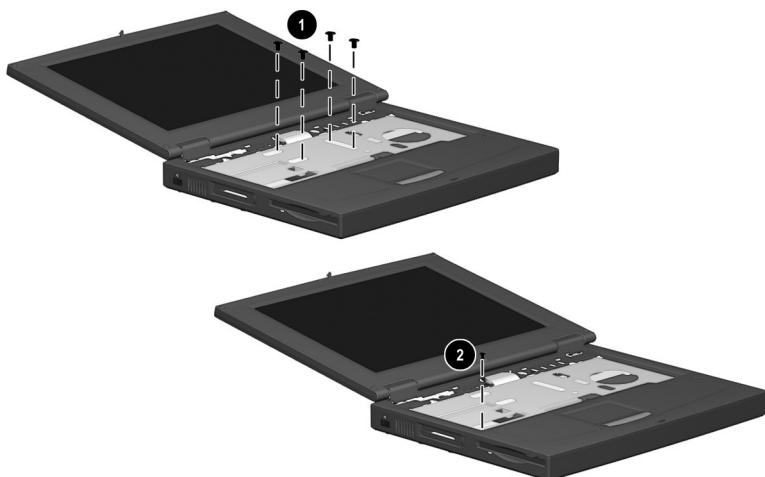


Figure 5–12: Removing the Heat Sink Screws

3. Lift the front edge of the heat sink and swing it up and back until the shield rests at a 45-degree angle ① (Figure 5-13).
4. Pull the heat sink away from the base enclosure at a 45-degree angle ② and remove it from the base enclosure.

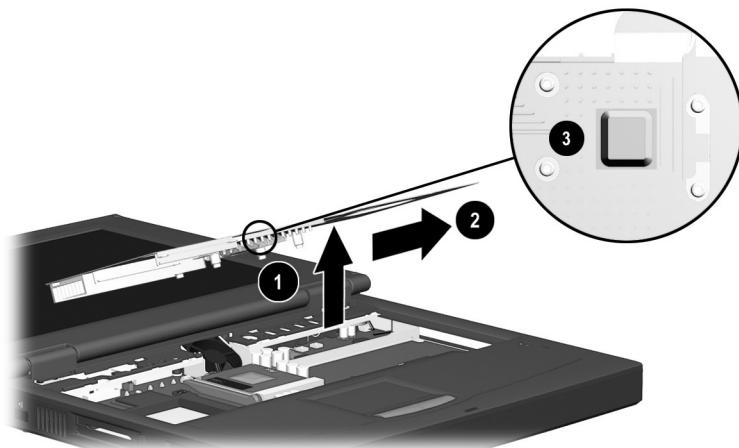


Figure 5–13: Removing the Heat Sink

A thermal pad ③ is installed on the heat sink and makes contact with the processor. Any time the heat sink is removed, inspect the thermal pad for damage.

Follow these steps to replace a damaged thermal pad:

- a. Carefully peel the old thermal pad from the heat sink area.
- b. Use a plastic straight edge tool (such as a credit card) to remove any thermal pad residue. Glue residue does not need to be totally removed. The glue used on the thermal pad has thermal conducting properties and will flow together with the glue from the new thermal pad.



CAUTION: Do not use any metal tools when removing thermal pad residue from the heat sink or processor. Failure to follow this caution can result in damage to these components and system failure.

-
- c. Peel the backing from the new thermal pad and position it on the heat sink in the same location as the old pad.

5.11 Processor

Processor Spare Part Number Information

Processors

| | |
|---------------------------|------------|
| 1.0 GHz Intel Pentium III | 269861-001 |
| 1.0 GHz Celeron | 269862-001 |
| 850 MHz Intel Pentium III | 253593-001 |
| 850 MHZ Intel Celeron | 253594-001 |
| 800 MHz Intel Pentium III | 233551-001 |
| 700 MHz Intel Celeron | 233549-001 |

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- LED cover (Section 5.6)
- Keyboard (Section 5.7)
- Optical drive (Section 5.8)
- Heat sink (Section 5.10)

2. Slide the processor lever to the left **1** and then swing it up and forward **2** until it is vertical (Figure 5-14).
3. Lift the outside edges of the processor straight up to remove it from the system board **3**.



When replacing the processor, make sure the processor is seated in the processor socket with the gold triangle in the rear left corner **4**.



If there is any thermal pad residue on the processor **5**, use a plastic straight edge tool (such as a credit card) to remove it. Refer to Section 5.10, “Heat Sink,” for instructions on replacing the thermal pad on the heat sink.

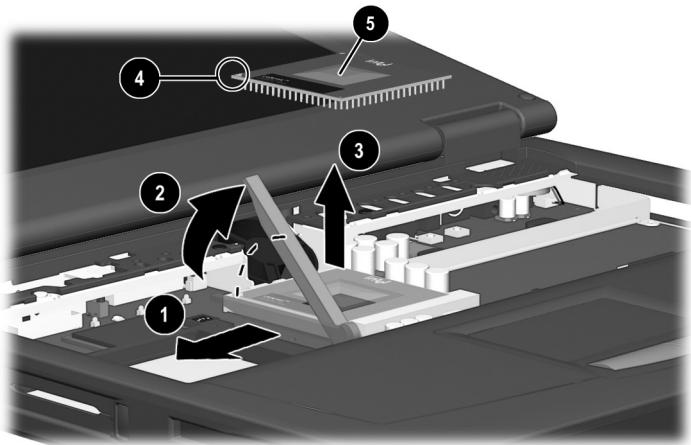


Figure 5–14: Removing the Processor



CAUTION: Do not use any metal tools when removing thermal pad residue from the heat sink or processor. Failure to follow this caution can result in damage to these components and system failure.

5.12 Top Cover

Top Cover Spare Part Number Information

Top cover

233568-001

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
 - LED cover (Section 5.6)
 - Keyboard (Section 5.7)
 - Optical drive (Section 5.8)
 - Display (Section 5.9)
 - Heat sink (Section 5.10)
 2. Turn the computer bottom side up with the front facing you.
-



The top cover is secured to the base enclosure by 15 screws that are two different sizes. Be sure to carefully note the size and location from which each screw was removed.

3. Remove the 10 M2.5 × 7 screws **1** and the three M2.5 × 4.5 screws **2** securing the top cover to the base enclosure (Figure 5-15).

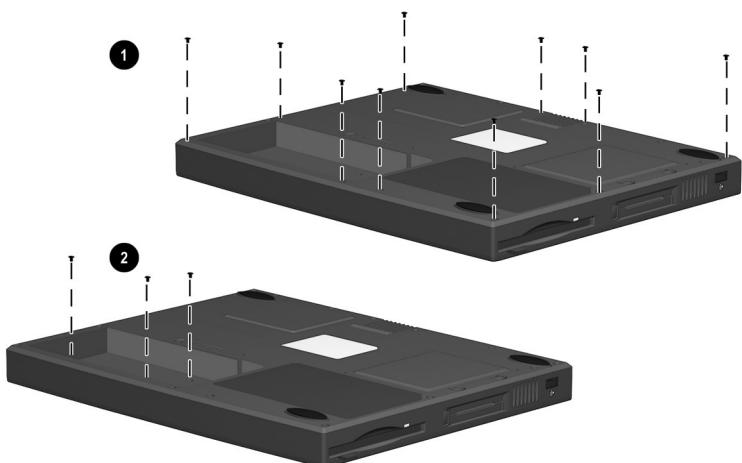


Figure 5–15: Removing the Top Cover Screws

4. Turn the computer top side up with the front facing you.
5. Disconnect the diskette drive cable from the low insertion force (LIF) connector on the system board ① (Figure 5-16).
6. Disconnect the TouchPad cable from the LIF connector on the system board ②.
7. Remove the two M2.5 × 4.5 screws securing the top cover to the base enclosure ③.
8. Lift the top cover straight up to remove it from the base enclosure ④.

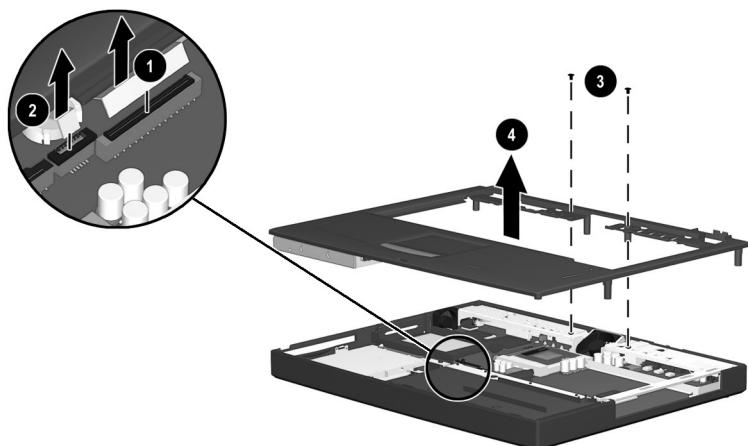


Figure 5–16: Removing the Top Cover

Reverse the above procedure to install the top cover.

5.13 Diskette Drive

Diskette Drive Spare Part Number Information

| | |
|-----------------------|------------|
| Diskette drive | 233553-001 |
|-----------------------|------------|

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
 - LED cover (Section 5.6)
 - Keyboard (Section 5.7)
 - Optical drive (Section 5.8)
 - Display (Section 5.9)
 - Heat sink (Section 5.10)
 - Top cover (Section 5.12)
2. Turn the top cover bottom side up with the front facing you.

3. Remove the two M2.5 × 4.5 screws securing the diskette drive to the top cover ① (Figure 5-17).
4. Remove the tape adhering the diskette drive and TouchPad cables to the top cover ②.
5. Remove the diskette drive from the top cover ③.

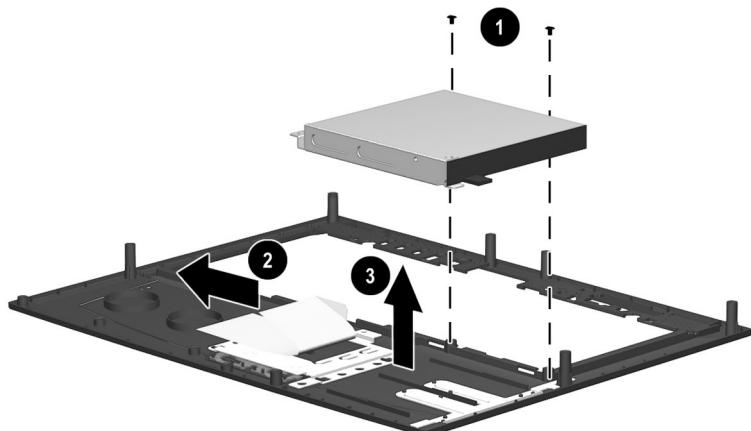


Figure 5–17: Removing the Diskette Drive

Reverse the above procedure to install the diskette drive.



When installing the diskette drive in the top cover, make sure the tab in the front right corner of the diskette drive fits into the slot in the front right corner of the top cover.

5.14 TouchPad

TouchPad Spare Part Number Information

TouchPad

236076-001

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- LED cover (Section 5.6)
- Keyboard (Section 5.7)
- Optical drive (Section 5.8)
- Display (Section 5.9)
- Heat sink (Section 5.10)
- Top cover (Section 5.12)

2. Remove the M2.5 × 4.5 screw ① securing the TouchPad bracket to the top cover (Figure 5–18).
3. Slide the TouchPad bracket forward ②.
4. Lift the TouchPad bracket up and remove it from the top cover ③.

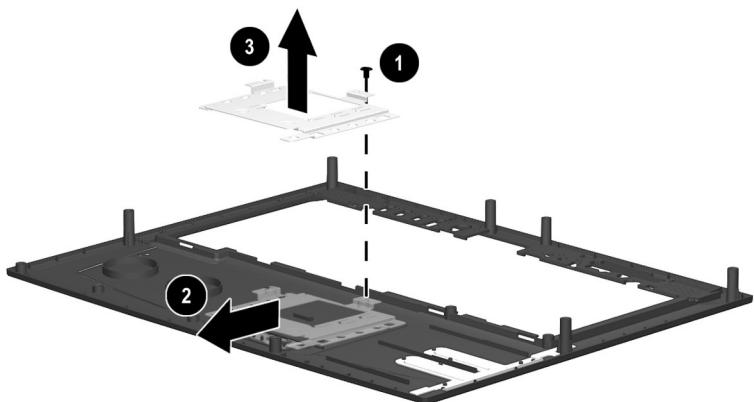


Figure 5–18: Removing the TouchPad Bracket

5. Remove the TouchPad board and cable from the top cover (Figure 5-19).

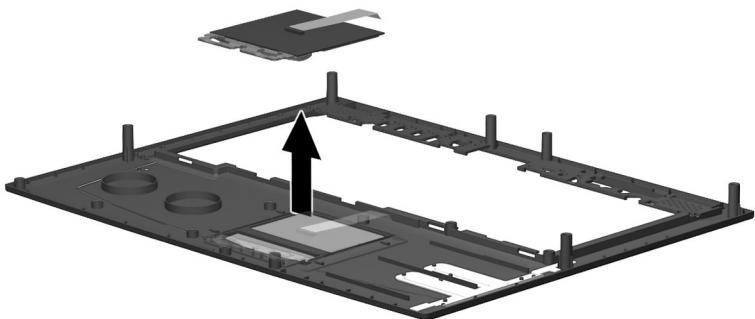


Figure 5–19: Removing the TouchPad

Reverse the above procedure to install the TouchPad.

5.15 Hard Drive

Hard Drive Spare Part Number Information

Hard drives

| | |
|------------------|------------|
| 20 GB hard drive | 253596-001 |
| 15 GB hard drive | 253595-001 |
| 10 GB hard drive | 233554-001 |

| | |
|--|------------|
| Hard drive bracket (included in Hardware kit) | 234005-001 |
|--|------------|



CAUTION: To prevent damage to the computer and hard drive and loss of information, shut down the computer before removing the hard drive from the computer. Do not remove the hard drive while the computer is on, in Suspend (Standby), or in Hibernation. If you are not sure whether the computer is in Hibernation, turn the computer on, then shut it down. If the computer is running a retail version of a Windows operating system, shut down the computer before removing any drive.

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
 - LED cover (Section 5.6)
 - Keyboard (Section 5.7)
 - Optical drive (Section 5.8)
 - Display (Section 5.9)
 - Heat sink (Section 5.10)
 - Top cover (Section 5.12)

2. Remove the three M2.5 × 5.5 screws ① securing the hard drive and hard drive bracket to the base enclosure (Figure 5-20).
3. Remove the hard drive bracket ② from the base enclosure.
4. Slide the hard drive toward the front of the base enclosure ③ to disconnect it from the system board.
5. Remove the hard drive from the base enclosure ④.

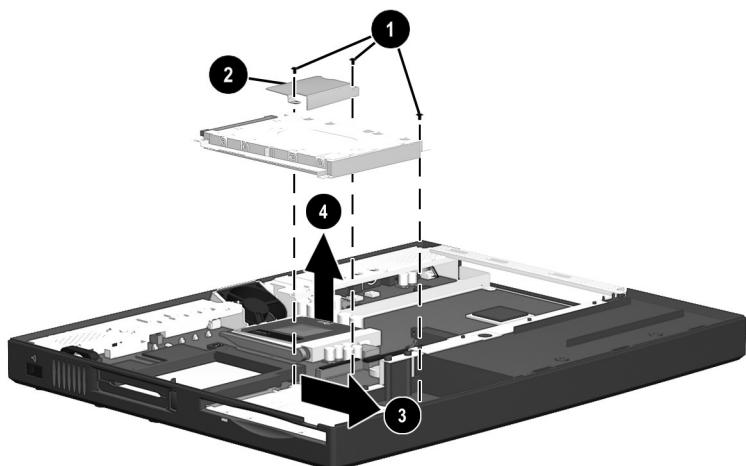


Figure 5–20: Removing the Hard Drive

Reverse the above procedure to install the hard drive.

5.16 Disk Cell Real Time Clock (RTC) Battery

Disk Cell RTC Battery Spare Part Number Information

Disk cell RTC battery

236359-001

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- LED cover (Section 5.6)
- Keyboard (Section 5.7)
- Optical drive (Section 5.8)
- Display (Section 5.9)
- Heat sink (Section 5.10)
- Top cover (Section 5.12)

2. Lift the edge of the battery to disconnect it from its socket (Figure 5-21).

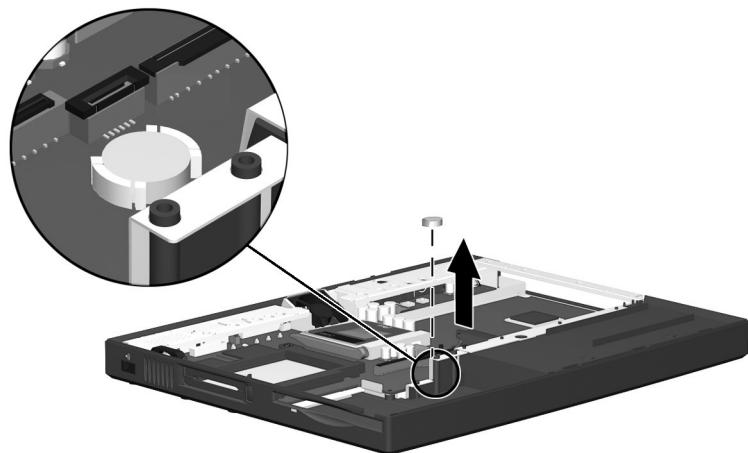


Figure 5–21: Removing the Disk Cell Battery

Reverse the above procedure to install the disk cell RTC battery.

5.17 Fan

Fan Spare Part Number Information

| | |
|---|------------|
| Fan | 233552-001 |
| Fan bracket (included in Hardware kit) | 234005-001 |

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- LED cover (Section 5.6)
- Keyboard (Section 5.7)
- Optical drive (Section 5.8)
- Display (Section 5.9)
- Heat sink (Section 5.10)
- Top cover (Section 5.12)

2. Remove the two M2.5 × 4.5 screws **1** securing the fan bracket and fan to the system board (Figure 5-22).
3. Disconnect the fan cable from the system board **2**.
4. Remove the fan bracket **3** and fan **4** from the base enclosure.

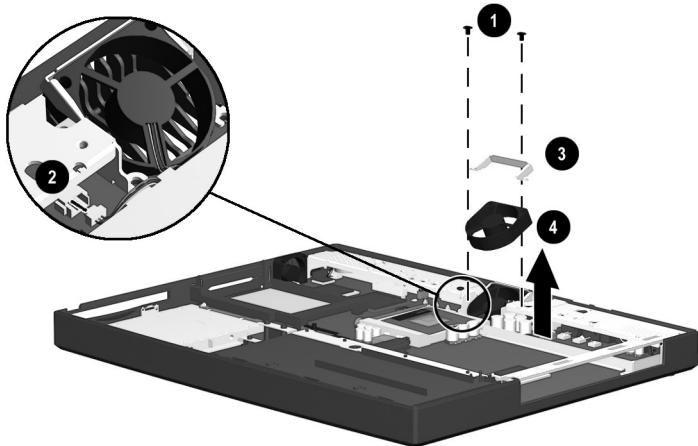


Figure 5–22: Removing the Fan

Reverse the above procedure to install the fan.



When installing the fan, route the fan cable ① under the clip ② on the processor mount as indicated in Figure 5-23.

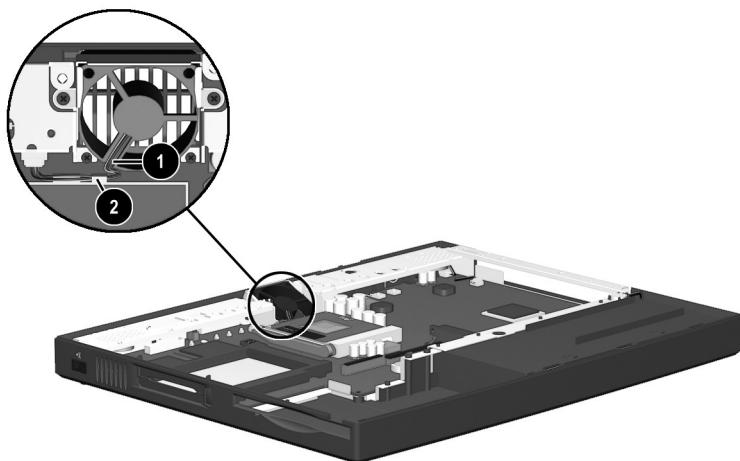


Figure 5–23: Routing the Fan Cable

5.18 System Board

System Board Spare Part Number Information

| | |
|--|------------|
| System board (includes 64 MB SDRAM, left and right speakers, and left and right brackets) | 233567-001 |
|--|------------|

| | |
|--|------------|
| Optical drive alignment rail (included in Hardware kit) | 234005-001 |
|--|------------|

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:

- Mini PCI communications board (Section 5.3)
- LED cover (Section 5.6)
- Keyboard (Section 5.7)
- Optical drive (Section 5.8)
- Display (Section 5.9)
- Heat sink (Section 5.10)
- Processor (Section 5.11)
- Top cover (Section 5.12)
- Hard drive (Section 5.15)
- Fan (Section 5.17)

2. Turn the base enclosure bottom side up with the rear panel facing you.

3. Remove the four M2.5 × 7 screws from the bottom of the base enclosure securing the system board to the base enclosure (Figure 5-24).

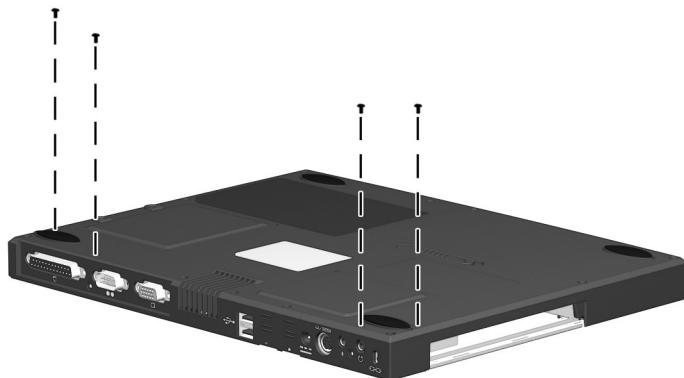


Figure 5–24: Removing the Exterior System Board Screws

4. Turn the base enclosure top side up with the front facing you.

5. Remove the M2.5 × 5.5 screw ① securing the optical drive alignment rail to the base enclosure (Figure 5-25).
6. Remove the two M2.5 × 5.5 screws ② securing the system board to the base enclosure.
7. Remove the optical drive alignment rail ③.
8. Disconnect the microphone cable ④ from the system board.

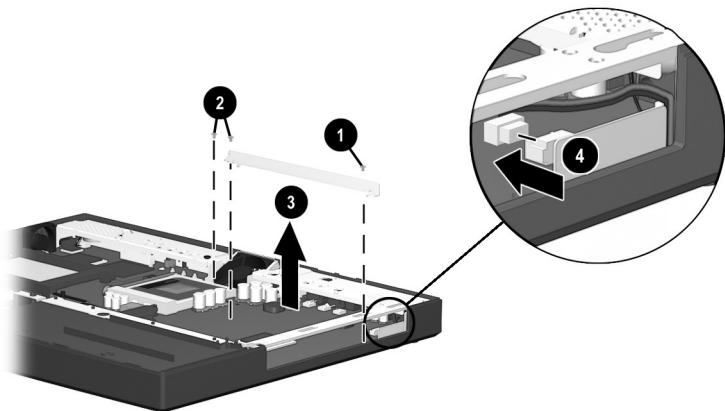


Figure 5–25: Removing the Interior System Board Screws, Optical Drive Alignment Rail, and Disconnecting the Microphone Cable

9. Make sure the PC Card eject button ① is fully depressed (Figure 5-26).
10. Lift up the front edge of the system board until the board is at a 45-degree angle ②.
11. Pull the system board away from the base enclosure at a 45-degree angle ③.

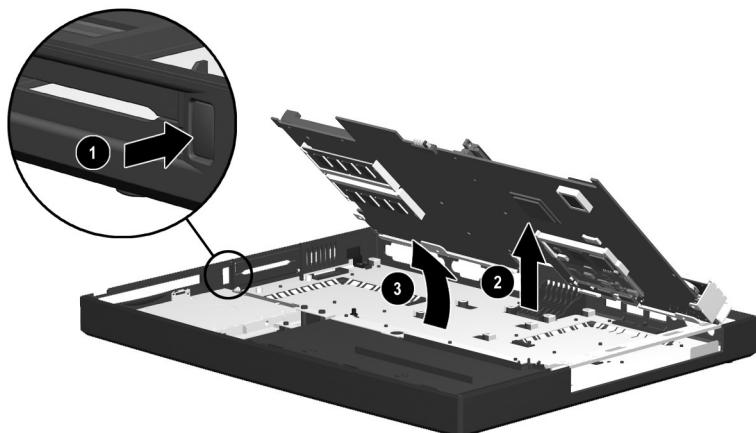


Figure 5–26: Removing the System Board

Reverse the above procedure to install the system board.



When installing the system board, route the microphone cable ① through the slot ② on the right side of the system board as indicated in Figure 5-27.

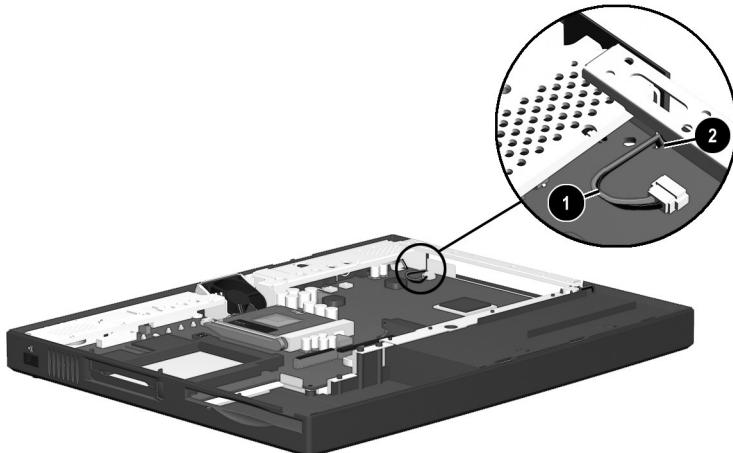


Figure 5–27: Routing the Microphone Cable

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Computer

Dimensions

| | | |
|--------|---------|--------|
| Height | 12.5 in | 318 mm |
| Depth | 1.7 in | 42 mm |
| Width | 9.8 in | 248 mm |

| | | |
|---------------|---|---|
| Weight | 7.1 to 7.4 lb depending on display configuration | 3.2 to 3.4 kg depending on display configuration |
|---------------|---|---|

Standalone (Battery) Power Requirements

| | |
|------------------------------------|----------|
| Nominal operating voltage (Li ion) | 11.1 VDC |
| Nominal operating voltage (NiMH) | 10.8 VDC |

AC Adapter Power Requirements

| | |
|---------------------|------------------------------------|
| Rated input power | 90 to 264 VAC RMS (auto switching) |
| Rated input current | < 60 W |
| Rated frequency | 47 to 63 Hz |

Temperature

| | | |
|--------------|--------------|--------------|
| Operating | 50 to 95° F | 10 to 35° C |
| Nonoperating | -4 to 140° F | -20 to 60° C |

Table 6-1
Computer (Continued)

Relative Humidity (non-condensing)

| | |
|--------------|--|
| Operating | 20 to 80% |
| Nonoperating | 20 to 90%, 101.6° F/38.7° C maximum wet bulb |

Altitude (unpressurized)

| | | |
|--------------|----------------|--------------|
| Operating | 0 to 10,000 ft | 0 to 3,048 m |
| Nonoperating | 0 to 40,000 ft | 0 to 9,144 m |

Shock

| | |
|--------------|------------------------|
| Operating | 0 G, 11 ms, half sine |
| Nonoperating | 60 G, 11 ms, half sine |

Vibration

| | |
|--------------|---|
| Operating | 0.5 G zero to peak, 10 to 500 Hz, 0.5 oct/min sweep rate |
| Nonoperating | 1.0 G zero to peak, 10 to 500 Hz, 0.50 oct/min sweep rate |



Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

Table 6-2
14.1-inch XGA, TFT Display

Dimensions

| | | |
|--------|----------|----------|
| Height | 8.42 in | 21.40 cm |
| Depth | 11.22 in | 28.50 cm |
| Width | 14.10 in | 35.81 cm |

Number of colors Up to 16.8 million

Contrast ratio 180:1

Brightness >150 nits typical

Pixel resolution

| | |
|---------------|---------------------|
| Pitch | 0.279 x 0.279 mm |
| Format | 1024 x 768 |
| Configuration | RGB vertical stripe |

Backlight Cold cathode fluorescent, 1 tube

Character display 80 x 25

Refresh 60 Hz

Total Power Consumption 8.0 W

Table 6-3
12.1-inch SVGA, TFT Display

Dimensions

| | | |
|--------|----------|----------|
| Height | 7.83 in | 19.90 cm |
| Depth | 10.83 in | 27.50 cm |
| Width | 12.10 in | 30.74 cm |

Number of colors Up to 16.8 million

Contrast ratio 250:1

Brightness >120 nits typical

Pixel resolution

| | |
|---------------|---------------------|
| Pitch | 0.3075 x 0.3075 mm |
| Format | 800 x 600 |
| Configuration | RGB vertical stripe |

Backlight Cold cathode fluorescent, 1 tube

Character display 80 x 25

Refresh 60 Hz

Total Power Consumption 4.5 W

Table 6-4
10.0-GB Hard Drive

| | 20.0 GB | 15.0 GB | 10.0 GB |
|---|----------------|----------------|----------------|
| User capacity per drive¹ | 20.0 GB | 15.0 GB | 10.0 GB |
| Drive height (in mm, with drive frame) | 9.5 mm | 9.5 mm | 9.5 mm |
| Drive width (in mm, with drive frame) | 70.0 mm | 70.0 mm | 63.5 mm |
| Interface type | ATA-5 | ATA-4 | ATA-4 |
| Seek times (typical read, including setting) | | | |
| Single track | 2.5 ms | 2.5 ms | 2.5 ms |
| Average | 12.0 ms | 12.0 ms | 13.0 ms |
| Full stroke | 23.0 ms | 23.0 ms | 24.0 ms |
| User addressable sectors³ | 39,070,080 | 23,579,136 | 19,640,880 |
| Logical configuration | | | |
| Cylinders | 22,784 | 16,683 | 16,683 |
| Heads | 16 | 16 | 16 |
| Sectors per track | 63 | 63 | 63 |

¹1 GB = 1,000,000,000 bytes.

²System capability may differ.

³Actual drive specifications may differ slightly.

Certain restrictions and exclusion apply. Consult the Compaq Customer Support Center for details.

Table 6-4
10.0-GB Hard Drive (Continued)

| | 20.0 GB | 15.0 GB | 10.0 GB |
|---|-----------------|-----------------|-----------------|
| Physical configuration | | | |
| Cylinders ³ | 22,784 | 25,800 | 22,784 |
| Heads | 4 | 2 | 2 |
| Sectors per track ³ | 293–560 | 398–731 | 293–560 |
| Bytes per sector | 512 | 512 | 512 |
| Buffer size³ | 2 MB | 2 MB | 512 KB |
| Disk rotational speed | 4200 rpm | 4200 rpm | 4200 rpm |
| Transfer rate | | | |
| Interface max (Mbytes/sec) ² | 66.6 | 66.6 | 66.6 |
| Media (Mbits/sec) ³ | 109–203 | 109–203 | 109–203 |

¹1 GB = 1,000,000,000 bytes.

²System capability may differ.

³Actual drive specifications may differ slightly.

Certain restrictions and exclusion apply. Consult the Compaq Customer Support Center for details.

Table 6-5
Diskette Drive

| | | |
|---------------------------|--------------|-------------|
| Diskette size | 3.5 inch | |
| Light | On system | |
| Height | 0.5 in | 12.7 mm |
| Bytes per sector | 512 | |
| Sectors per track | | |
| High density | 18 (1.44-MB) | 15 (1.2-MB) |
| Low density | 9 | |
| Tracks per side | | |
| High density | 80 | |
| Low density | 80 | |
| Read/write heads | 2 | |
| Average seek times | | |
| Track-to-track (high/low) | 3 ms | 6 ms |
| Average (high/low) | 95 ms | 174 ms |
| Settling time | 15 ms | |
| Latency average | 100 ms | |

Table 6-6
CD-ROM Drive

| | | |
|----------------------------------|--|-------|
| Applicable disk | CD-ROM (Mode 1, 2, and 3) CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD-Extra Video CD CD-WO (fixed packets only) CD-Bridge | |
| Center hole diameter | .59 in | 15 mm |
| Disk diameter | 12 cm, 8 cm | |
| Disk thickness | 1.2 mm | |
| Track pitch | 1.6 μ | |
| Access time | | |
| Random | < 150 ms | |
| Full Stroke | < 300 ms | |
| Cache buffer | 128 KB | |
| Data transfer rate | | |
| Sustained, 24X | 2400 KB/sec (150 KB/sec at 1X) | |
| Variable | 1500 to 3600 KB/sec (10X to 24X) | |
| Normal PIO Mode 4 (single burst) | 16.66 KB/sec | |
| Startup time | < 8 seconds | |
| Stop time | < 4 seconds | |

Table 6-7
DVD-ROM Drive

| | | |
|---------------------------------|--|-------|
| Applicable disk | DVD-5, DVD-9, DVD-10 CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD-Bridge | |
| Center hole diameter | .59 in | 15 mm |
| Disk diameter | 12 cm, 8 cm | |
| Disk thickness | 1.2 mm | |
| Track pitch | .74 µ | |
| Access time | | |
| Random | < 150 ms | |
| Full Stroke | < 225 ms | |
| Audio output level | | |
| Lineout | 0.7 V rms | |
| Headphone | none | |
| Cache buffer | 128 KB | |
| Data transfer rate | | |
| Sustained, 1X DVD rate | 150 KB/sec | |
| Sustained, 16X DVD rate | 2400 KB/sec | |
| Sustained, 1X DVD rate | 1380 KB/sec | |
| Sustained, 4X DVD rate | 5520 KB/sec | |
| Normal IO Mode 4 (single burst) | 16.6 MB/sec | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

Table 6-8
AC Adapter

| | | |
|-----------------------------|----------------------------|---------|
| Weight | 0.45 lb | 0.21 kg |
| Power supply (input) | | |
| Operating voltage | 100 to 240 VAC RMS Nominal | |
| Operating current | 1.5 A RMS | |
| Operating frequency range | 50 to 60 Hz Nominal | |
| Maximum transient | 4/50 kV | |

Table 6-9
Battery Packs

Dimensions

Lithium ion (Li ion)

| | | |
|--------|----------|---------|
| Height | 0.83 in | 21 mm |
| Length | 3.15 in | 166 |
| Width | 6.55 in | 81 |
| Weight | 0.97 lb | 0.44 kg |
| Cells | 9 Li ion | |

Nickel Metal Hydride (NiMH)

| | | |
|--------|-----------|---------|
| Height | 0.83 in | 21 mm |
| Length | 3.15 in | 166 |
| Width | 6.55 in | 81 |
| Weight | 0.1.32 lb | 0.60 kg |
| Cells | 9 NiMH | |

Energy

Li ion

| | |
|--------------------|---------|
| Voltage | 11.1 V |
| Amp-hour capacity | 4.8 Ah |
| Watt-hour capacity | 53.2 Wh |

NiMH

| | |
|--------------------|---------|
| Voltage | 10.8 V |
| Amp-hour capacity | 4.5 Ah |
| Watt-hour capacity | 48.6 Wh |

Environmental requirements

Temperature

| | | |
|--------------|------------------|-----------------|
| Operating | 50° F to 104° F | 10° C to 40° C |
| Nonoperating | -12° F to 140° F | -30° C to 60° C |

Table 6-10
System DMA

Hardware DMA System Function

| | |
|--|--|
| DMA0 | Available for audio |
| DMA1 | Entertainment audio (default; alternate = DMA0, DMA3, none) |
| DMA2 | Diskette drive |
| DMA3 | ECP parallel port LPT1 (default; alternate = DMA0, none) |
| DMA4 | DMA controller cascading (not available) |
| DMA5 | Available for PC Card |
| DMA6 | not assigned |
| DMA7 | not assigned |
|  PC Card controller | can use DMA 1, 2, or 5. |

Table 6-11
System Interrupts

| Hardware IRQ | System Function |
|--------------|---|
| IRQ0 | System timer |
| IRQ1 | Keyboard controller |
| IRQ2 | Cascaded |
| IRQ3 | COM2 |
| IRQ4 | COM1 |
| IRQ5 | Audio (default)* |
| IRQ6 | Diskette drive |
| IRQ7 | Parallel port |
| IRQ8 | Real time clock (RTC) |
| IRQ9 | Infrared |
| IRQ10 | System use |
| IRQ11 | System use |
| IRQ12 | Internal point stick or external mouse |
| IRQ13 | Coprocessor (not available to any peripheral) |
| IRQ14 | IDE interface (hard drive and optical drive) |
| IRQ15 | System use |



PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ 4.

*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

Table 6-12
System I/O Addresses

| I/O Address (hex) | System Function (shipping configuration) |
|--------------------------|---|
| 000 - 00F | DMA controller no. 1 |
| 010 - 01F | unused |
| 020 - 021 | Interrupt controller no. 1 |
| 022 - 024 | Opti chipset configuration registers |
| 025 - 03F | unused |
| 02E - 02F | 87334 "Super IO" configuration for CPU |
| 040 - 05F | Counter/timer registers |
| 044 - 05F | unused |
| 060 | Keyboard controller |
| 061 | Port b |
| 062 - 063 | unused |
| 064 | Keyboard controller |
| 065 - 06F | unused |
| 070 - 071 | NMI enable/real time clock |
| 072 - 07F | unused |
| 080 - 08F | DMA page registers |
| 090 - 091 | unused |
| 092 | Port A |
| 093 - 09F | unused |
| 0A0 - 0A1 | Interrupt controller no. 2 |

Table 6-12
System I/O Addresses (Continued)

| I/O Address (hex) | System Function (shipping configuration) |
|--------------------------|---|
| 0A2 - 0BF | unused |
| 0C0 - 0DF | DMA controller no. 2 |
| 0E0 - 0EF | unused |
| 0F0 - 0F1 | Coprocessor busy clear/reset |
| 0F2 - 0FF | unused |
| 100 - 16F | unused |
| 170 - 177 | Secondary fixed disk controller |
| 178 - 1EF | unused |
| 1F0 - 1F7 | Primary fixed disk controller |
| 1F8 - 200 | unused |
| 201 | Joystick (decoded in ESS1688) |
| 202 - 21F | unused |
| 220 - 22F | Entertainment audio |
| 230 - 26D | unused |
| 26E - 26 | unused |
| 278 - 27F | unused |
| 280 - 2AB | unused |
| 2A0 - 2A7 | unused |
| 2A8 - 2E7 | unused |
| 2E8 - 2EF | Reserved serial port |

Table 6-12
System I/O Addresses (Continued)

| I/O Address (hex) | System Function (shipping configuration) |
|--------------------------|---|
| 2F0 - 2F7 | unused |
| 2F8 - 2FF | Infrared port |
| 300 - 31F | unused |
| 320 - 36F | unused |
| 370 - 377 | Secondary diskette drive controller |
| 378 - 37F | Parallel port (LPT1/default) |
| 380 - 387 | unused |
| 388 - 38B | FM synthesizer - OPL3 |
| 38C - 3AF | unused |
| 3B0 - 3BB | VGA |
| 3BC - 3BF | Reserved (parallel port/no EPP support) |
| 3C0 - 3DF | VGA |
| 3E0 - 3E1 | PC Card controller in CPU |
| 3E2 - 3E3 | unused |
| 3E8 - 3EF | Internal modem |
| 3F0 - 3F7 | "A" diskette controller |
| 3F8 - 3FF | Serial port (COM1/default) |
| CF8 - CFB | PCI configuration index register (PCIDIVO-1) |
| CFC - CFF | PCI configuration data register (PCIDIVO-1) |

Table 6-13
System Memory Map

| Size | Memory Address | System Function |
|-------------|------------------------|------------------------------|
| 640 K | 00000000 - 0009FFFF | Base memory |
| 128 K | 000A0000 - 000BFFFF | Video memory |
| 48 K | 000C0000 - 000CBFFF | Video BIOS |
| 160 K | 000C8000 - 000E7FFF | unused |
| 64 K | 000E8000 - 000FFFFFF | System BIOS |
| 15 M | 00100000 - 00FFFFFF | Extended memory |
| 58 M | 01000000 - 047FFFFFF | Super extended memory |
| 58 M | 04800000 - 07FFFFFF | unused |
| 2 M | 08000000 - 080FFFFFF | Video memory (direct access) |
| 4 G | 08200000 - FFFFEFFFF | unused |
| 64 K | FFFFF0000 - FFFFFFFFFF | System BIOS |

A

Connector Pin Assignments

Table A-1
Stereo Speaker/Headphone



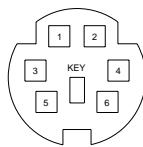
| Pin | Signal | Pin | Signal |
|-----|-----------|-----|--------|
| 1 | Audio out | 2 | Ground |

Table A-2
Microphone



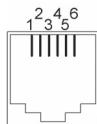
| Pin | Signal | Pin | Signal |
|-----|----------|-----|--------|
| 1 | Audio in | 2 | Ground |

Table A-3
Keyboard/Mouse



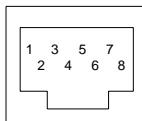
| Pin | Signal | Pin | Signal |
|-----|----------------------|-----|-----------------------|
| 1 | Keyboard/mouse data1 | 4 | +5 VDC |
| 2 | Keyboard/mouse data2 | 5 | Keyboard/mouse clock1 |
| 3 | Ground | 6 | Keyboard/mouse clock2 |

Table A-4
RJ-11 Modem



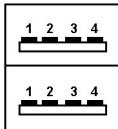
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | Unused | 4 | Unused |
| 2 | Tip | 5 | Unused |
| 3 | Ring | 6 | Unused |

Table A-5
RJ-45 Network Interface



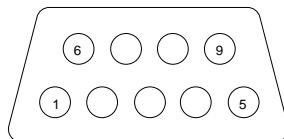
| Pin | Signal | Pin | Signal |
|-----|------------|-----|-----------|
| 1 | Transmit + | 5 | Unused |
| 2 | Transmit - | 6 | Receive - |
| 3 | Receive + | 7 | Unused |
| 4 | Unused | 8 | Unused |

Table A-6
Universal Serial Bus



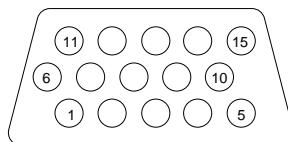
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | +5 VDC | 3 | Data + |
| 2 | Data - | 4 | Ground |

Table A-7
Serial



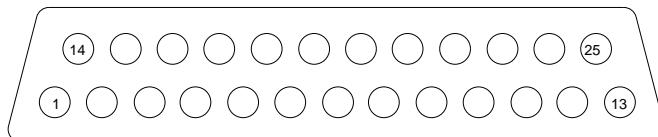
| Pin | Signal | Pin | Signal |
|-----|---------------------|-----|----------------|
| 1 | Carrier detect | 6 | Data set ready |
| 2 | Receive data | 7 | Ready to send |
| 3 | Transmit data | 8 | Clear to send |
| 4 | Data terminal ready | 9 | Ring indicator |
| 5 | Signal ground | | |

Table A-8
External Monitor



| Pin | Signal | Pin | Signal |
|-----|---------------|-----|-----------------|
| 1 | Red analog | 9 | +5 VDC |
| 2 | Green analog | 10 | Ground |
| 3 | Blue analog | 11 | Monitor detect |
| 4 | Not connected | 12 | DDC 2B data |
| 5 | Ground | 13 | Horizontal sync |
| 6 | Ground analog | 14 | Vertical sync |
| 7 | Ground analog | 15 | DDC2B clock |
| 8 | Ground analog | | |

Table A-9
Parallel



| Pin | Signal | Pin | Signal |
|-----|------------|-------|---------------------|
| 1 | Strobe* | 10 | Acknowledge* |
| 2 | Data bit 0 | 11 | Busy |
| 3 | Data bit 1 | 12 | Paper out |
| 4 | Data bit 2 | 13 | Select |
| 5 | Data bit 3 | 14 | Auto line feed* |
| 6 | Data bit 4 | 15 | Error* |
| 7 | Data bit 5 | 16 | Initialize printer* |
| 8 | Data bit 6 | 17 | Select in* |
| 9 | Data bit 7 | 18-25 | Signal ground |

*Signal is active low.

Power Cord Set Requirements

3-Conductor Power Cord Set

The wide range input features enable the computer to operate from any line voltage from 100 to 120 or 220 to 240 volts AC.

The power cord set received with the computer meets the requirements for use in the country where the equipment is purchased.

Power cord sets for use in other countries must meet the requirements of the country where the computer is used. For more information on power cord set requirements, contact a Compaq authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

1. The length of the power cord set must be at least 5.00 feet (1.5 m) and a maximum of 6.50 feet (2.0 m).
2. All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.

3. The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
4. The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements—By Country

| Country | Accredited Agency | Applicable Note Number |
|-----------------|--------------------------|-------------------------------|
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | METI | 3 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |
| United Kingdom | BSI | 1 |
| United States | UL | 2 |

Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

C

Screw Listing

This appendix provides specification and reference information for the screws used in the computer. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 233656-001.

Table C-1
M2.5 × 5 Screw

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 2 | 5 mm | M2.5 | 5.5 mm |

Where used: 2 screws securing the keyboard to the base enclosure
(documented in Section 5.7)



Table C-2
M2.5 × 4.5 Screw

| | Color | Qty | Length | Thread | Head Width |
|---|--------------|------------|---------------|---------------|-------------------|
|   | Black | 15 | 4.5 mm | M2.5 | 4 mm |

Where used: 2 screws securing the hinge covers to the display hinges (documented in Section 5.6).



Table C-2
M2.5 × 4.5 Screw (Continued)

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 15 | 4.5 mm | M2.5 | 4 mm |

Where used:

- ① 1 screw securing the optical drive to the heat sink (documented in Section 5.8)
 - ② 1 screw securing the display ground cable to the base enclosure (documented in Section 5.9)
 - ③ 1 screw securing the heat sink to the base enclosure (documented in Section 5.10)
-

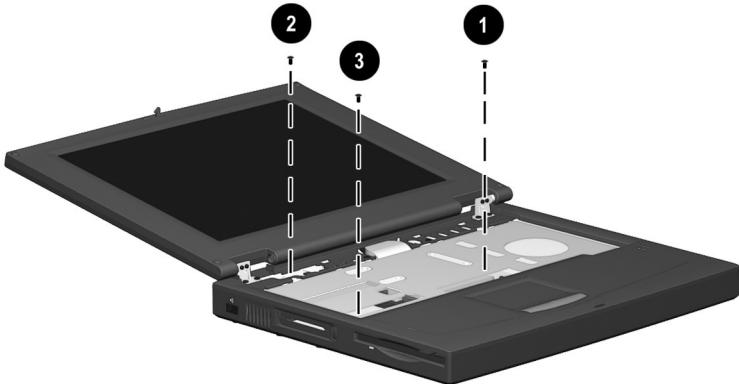


Table C-2
M2.5 × 4.5 Screw (*Continued*)

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 15 | 4.5 mm | M2.5 | 4 mm |

Where used:

- ❶ 3 screws securing the top cover to the base enclosure through the battery bay (documented in Section 5.11)
 - ❷ 2 screws securing the top cover to the base enclosure through the top (documented in Section 5.11)
-

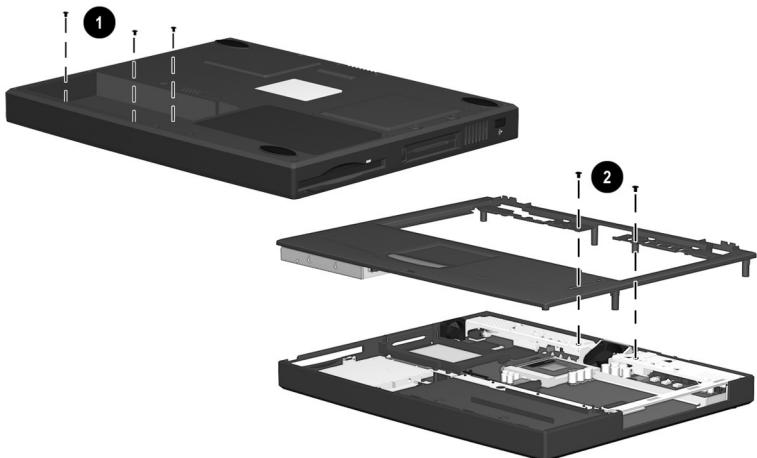


Table C-2
M2.5 × 4.5 Screw (*Continued*)

| | Color | Qty | Length | Thread | Head Width |
|--|-------|-----|--------|--------|------------|
| | Black | 15 | 4.5 mm | M2.5 | 4 mm |

Where used:

- ① 2 screws securing the diskette drive to the top cover (documented in Section 5.12)
 - ② 1 screw securing the TouchPad to the top cover (documented in Section 5.13)
-

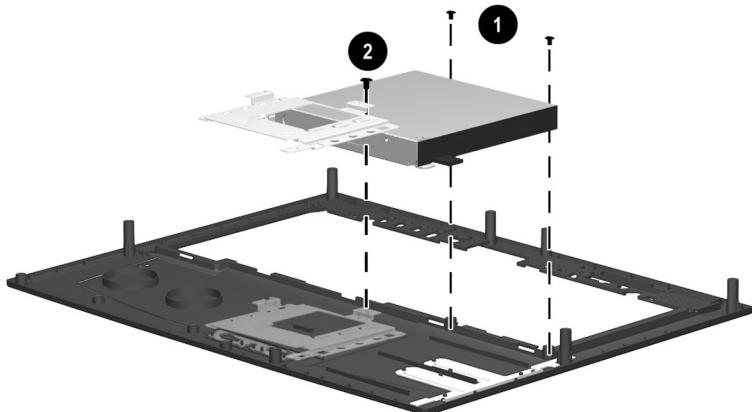


Table C-2
M2.5 × 4.5 Screw (*Continued*)

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 15 | 4.5 mm | M2.5 | 4 mm |

Where used: 2 screws securing the fan and fan bracket to the base enclosure (documented in Section 5.16)

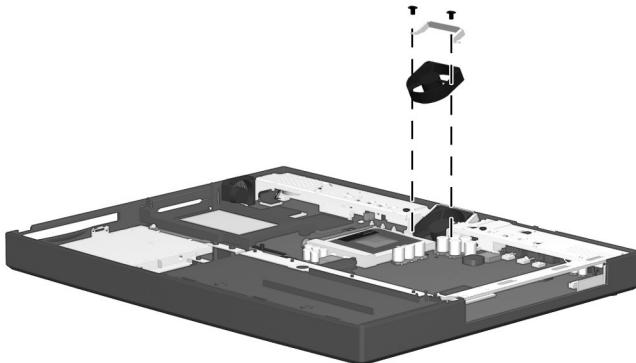


Table C-3
M2.5 x 7 Screw

|   | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
| | Black | 25 | 7 mm | M2.5 | 4.5 mm |

Where used:

- 1 screw securing the modem/network interface card compartment cover to the base enclosure (refer to the *Hardware Guide* included with the computer for installation procedure)
 - 2 screws securing the memory expansion compartment cover to the base enclosure (refer to the *Hardware Guide* included with the computer for installation procedure)
 - 4 screws securing the display to the base enclosure (illustrated below; documented in Section 5.9)
-

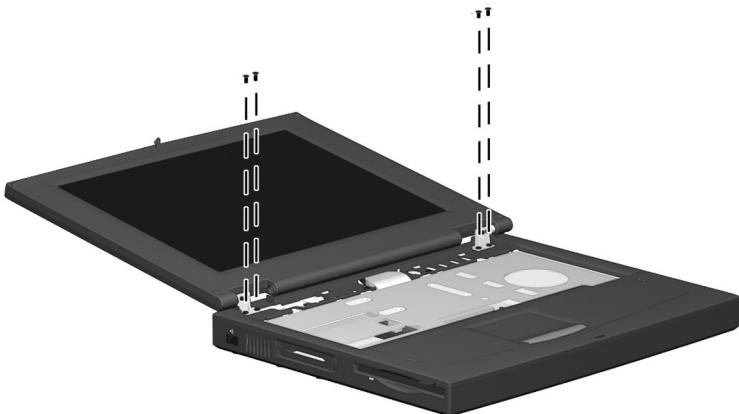


Table C-3
M2.5 × 7 Screw (Continued)

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 25 | 7 mm | M2.5 | 4.5 mm |

Where used:

- ① 4 screws securing the heat sink to the base assembly (documented in Section 5.10)
 - ② 10 screws securing the top cover to the base enclosure through the bottom of the computer (documented in Section 5.11)
-

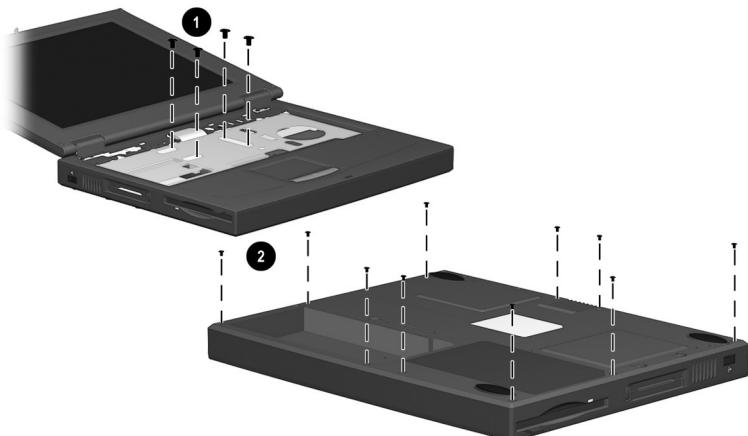


Table C-3
M2.5 × 7 Screw (*Continued*)

|  | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
| | Black | 25 | 7 mm | M2.5 | 4.5 mm |

Where used: 4 screws securing the system board to the base enclosure through the computer bottom (documented in Section 5.17)

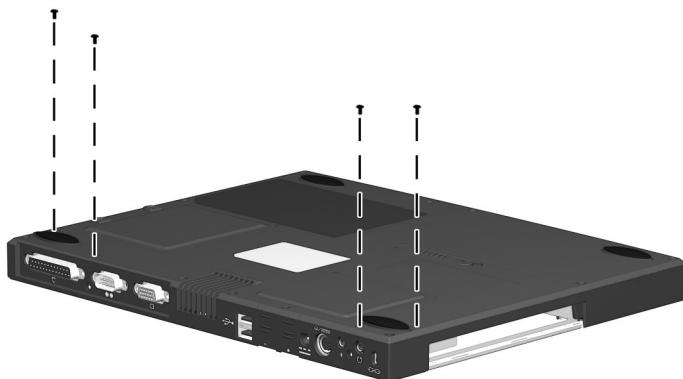
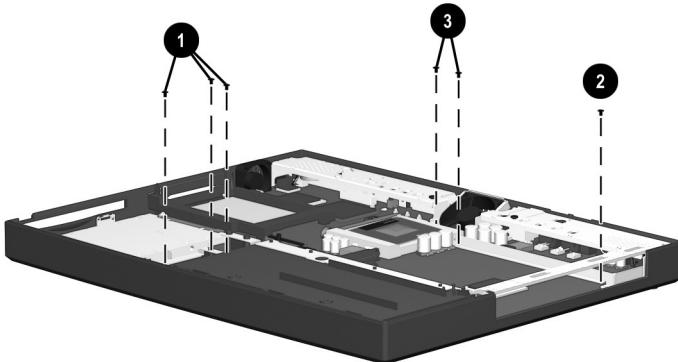


Table C-4
M2.5 × 5.5 Screw

| | Color | Qty | Length | Thread | Head Width |
|---|-------|-----|--------|--------|------------|
|   | Black | 6 | 5.5 mm | M2.5 | 4.5 mm |

Where used:

- ❶ 3 screws securing the hard drive and hard drive bracket to the base enclosure (documented in Section 5.14)
 - ❷ 1 screw securing the optical drive alignment rail to the base enclosure (documented in Section 5.17)
 - ❸ 2 screws securing the system board to the base enclosure (documented in Section 5.17)
-



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